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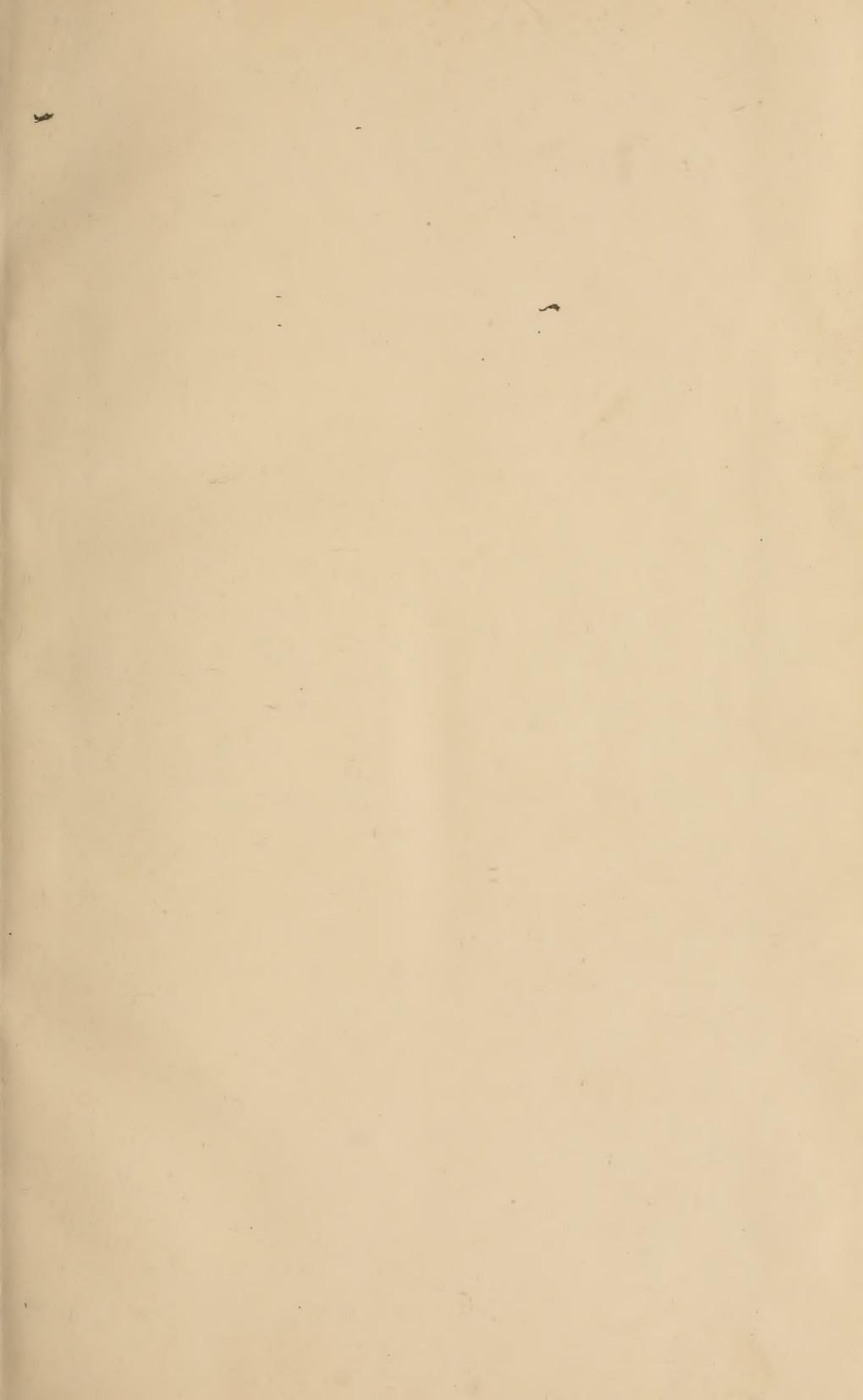
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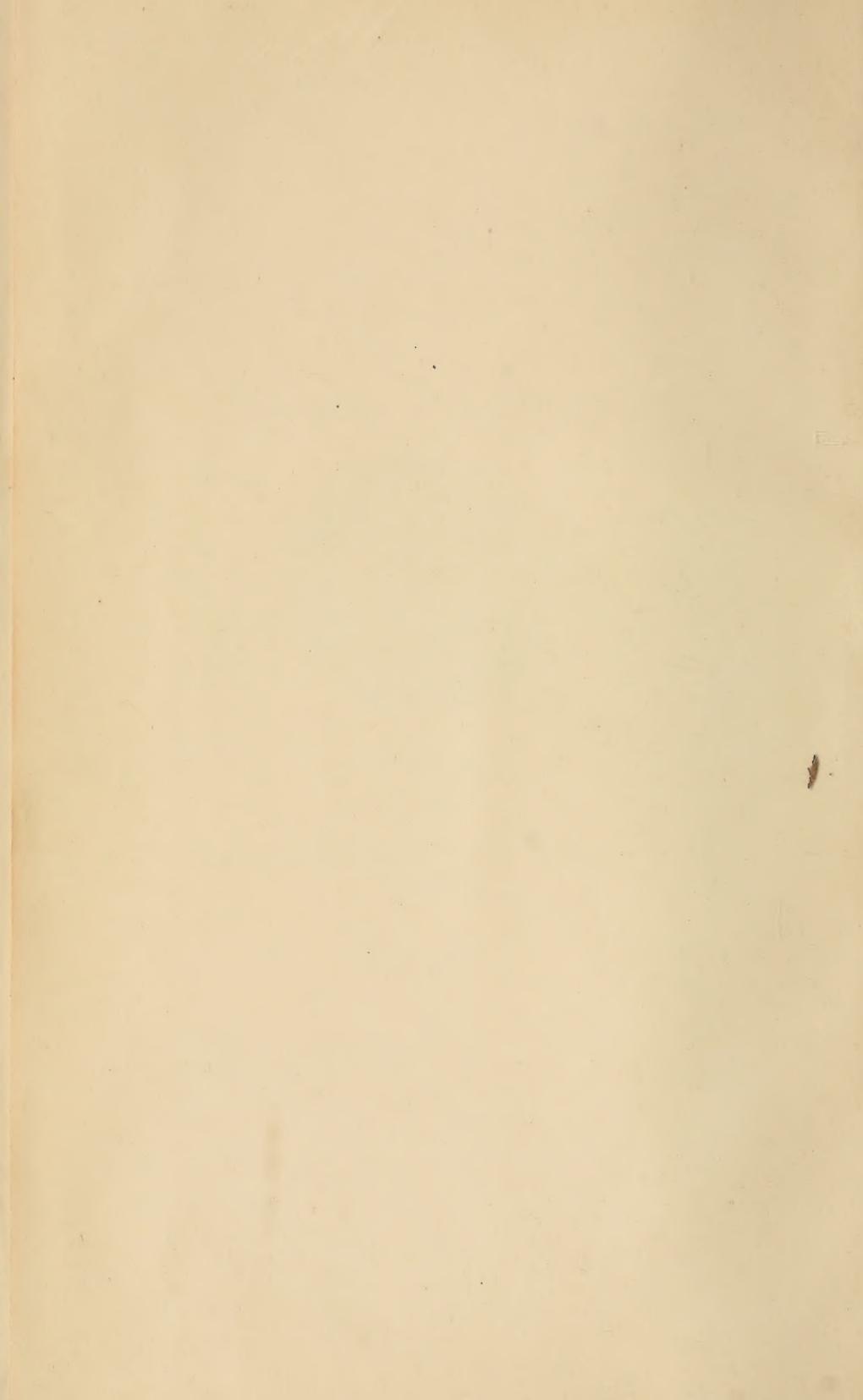
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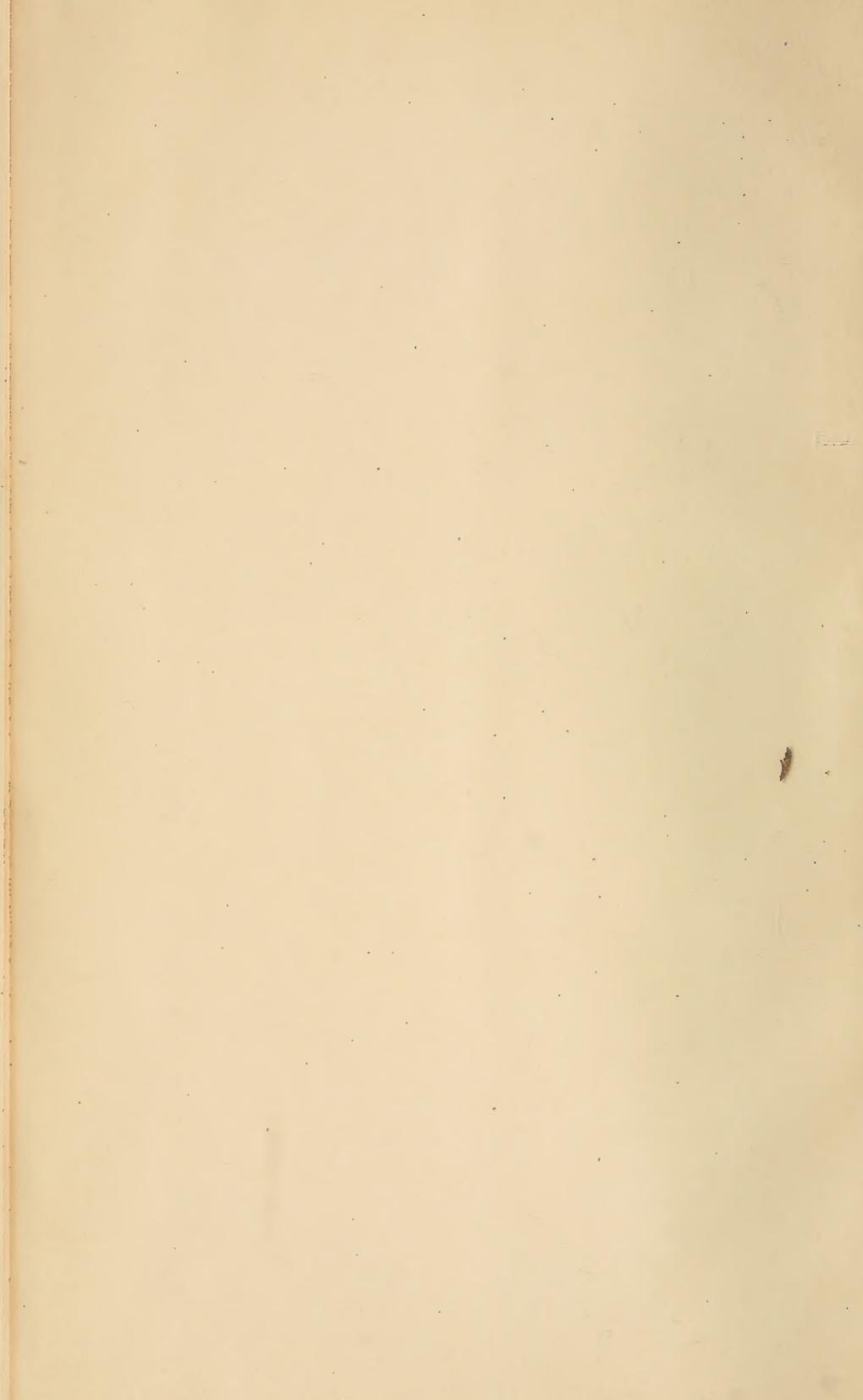
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THE

# VICTORIAN NATURALIST:

THE JOURNAL & MAGAZINE

OF THE

## Field Naturalists' Club of Victoria.

*Editor: A. H. S. LUCAS, M.A., B.Sc.*

**VOL. VIII.**

MAY, 1891, TO APRIL, 1892.

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The author of each article is responsible for the facts and  
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Melbourne:

WALKER, MAY & CO., PRINTERS, 9 MACKILLOP STREET  
(OFF 390 LITTLE COLLINS STREET).

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VOL. VIII.—NO. I.

MAY, 1891.

# The Victorian Naturalist:

THE JOURNAL AND MAGAZINE

— OF —

The Field Naturalists' Club of Victoria.

**PUBLISHED MAY 7, 1891.**

The Author of each article is responsible for the facts and opinions he records.

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THE  
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VOL. VIII.—No. 1.

MAY, 1891.

No. 89

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FIELD NATURALISTS' CLUB OF VICTORIA.

THE ordinary monthly meeting of the above Club was held in the Royal Society's Hall on the 9th February, when there was an unusually full attendance of members and friends.

In the absence of the president, Professor W. Baldwin Spencer occupied the chair.

After the minutes of the general meetings of the 8th and 15th December had been confirmed, the Club had a pleasing duty to perform in offering congratulations to two gentlemen intimately connected with it. In fulfilling this duty the Rev. J. J. Halley, in suitable terms, conveyed congratulations to Mr. Arthur Dendy on his obtaining the degree of Doctor of Science from the Victoria University. Ever since his connection with the Club Dr. Dendy has taken the greatest interest in its progress, and has been unsparing in his endeavours to advance the objects for which the Club was founded. Mr. Halley's remarks, therefore, were received with great cordiality, and a resolution suitable to the occasion was carried unanimously.

Professor Spencer then called attention to the fact that another honour had fallen to one of the patrons of the Club, and proposed that congratulations should be transmitted to Professor M'Coy upon the distinction lately conferred upon him by Her Majesty the Queen. There are only some six or seven biological knights, and it is a fact worthy of note that the Field Naturalists' Club of Victoria can lay claim to two of that limited number in the persons of its two science patrons. The proposition naturally was received and carried with acclamation.

The usual reports of the Club's recent excursions were then received, Mr. D. Le Souëf taking charge of that to the Plenty River, whilst that to Macedon was in the hands of Mr. E. Anderson. A good collection of insects were obtained on the former excursion, whilst Macedon furnished a case of butterflies and some seven distinct species of land planarians and a peripatus.

The real business of the evening, however, now commenced. This was a joint paper contributed by A. Dendy, D.Sc., A. W. Howitt, F.G.S., and A. H. S. Lucas, M.A., B.Sc., on "A Visit to the Mount Wellington District." We can only refer in general terms to this most interesting paper, the full text of which will be published in the *Naturalist*. The visit was undertaken for the purpose of investigating the problem of the formation of the lake,

to collect new and rare natural history specimens, and to obtain a series of photographs ; and the gentlemen engaged in it were specially qualified by previous training and experience to carry out these objects successfully. Previous expeditions had been made to that locality. Fifty years before, the lake had been discovered by the blacks ; then by Snowden, a stockman, in 1886. A little later Mr. A. W. Howitt made three attempts by way of the Avon Ranges, and eventually succeeded in reaching the lake, Easter, 1887, in company with one of the blacks who was amongst the original discoverers. Mr. Riggall also made a successful attempt in 1887, and the Misses Howitt, in company with their father, in the following year. The route taken by the present party was northward from Heyfield, through Glenmaggie and Glen Fallock, along the valley of the Macallister and Wellington rivers as far as Crinoline Hill ; then, turning eastward, the Wellington River was followed to the north of Mt. Wellington, and, successfully climbing the mountain, the first glimpse of the lake was caught. This lake has an area of some 23 acres, and is kept in the valley by a dam, from 50 to 100 feet high, built like a breakwater of boulders, and covered with scrub and trees. Below this barrier, on the side removed from the lake, is a veritable "Valley of Destruction," with a middle ridge and side troughs, all piled with huge blocks of quartz and porphyry. On the Wellington side of this precipice, and towering for a height of 400 feet, are "Dendy's Heights," so named because Dr. Dendy, on this visit, took the first photograph ever taken of the scene. At a depth of 550 feet below the level of the lake a number of springs filter through the barrier, and form feeders to the Barrier Creek.

The problem of the formation of the lake strongly excited the interest of the travellers, and hypotheses were laid down which, we venture to think, need further confirmation. Mr. Howitt's is the most popular one, although, as Mr. Lucas showed, it is open to severe criticism. He maintains that glacial action dug out the bed of the lake, and deposited its terminal moraine at the narrow point in the valley ; this is now represented by the dam which holds up the water. Mr. Lucas remarked that this theory lacked supporting evidence in the absence of recognized glacial action elsewhere, and that the angularity of the rocks proves them of more recent origin. His own theory reads well—fissures in the igneous rocks have opened up a more direct communication with the bed of the river above and the valley below than over the lip of the upper valley. Drainage from the upper valley and from the lip caused the hollowing out of the bed of the lake. Dr. Dendy is a little more modest, and supposes the dam owes its origin to the landslips which occurred on either side of the throat

of the valley. With theories so divergent before us, we may still regard the question as quite an open one, and if the paper does no more than call attention to this—geologically speaking—interesting district, and excites a desire in competent men to attempt to settle the point more satisfactorily, it will have been of great value to geological science. Although this question of the formation of the lake had to be "given up" by the explorers, they are to be congratulated on adding some new species of plants and animals to our present knowledge: to the former a probably new characeous plant and a rare purple Goodenia; and to the latter a new frog, fish, a new variety of crayfish, and a new land planarian. We ought to add that such expeditions require time, money, energy, and skill to carry out successfully, and the gentlemen engaged in this one deserve the sincerest thanks and congratulations of every member of the Club.

This forms a fitting close to the series of "long excursions" for the present year, and will rank very worthily indeed with those to the Kent Group and the Yarra Falls, which have so recently been of botanical or zoological interest.

It is worthy of note that the photographic slides by which the lecture was illustrated were prepared by Dr. Dendy, and the lantern was placed at the disposal of the Club by Mr. W. Kernot, and worked by him with more than his usual skill. At the close of the meeting a vote of thanks was cordially accorded to Mr. Kernot for his skilful assistance.

On a ballot being taken, Mr. George Britton was elected a member of the Club.

The hon. librarian reported the following additions to the library:—"Transactions of the Royal Society of South Australia," vol. xiii., part 2; "Journal of the New York Microscopical Society," vol. vi., No. 4; "Proceedings of the Linnean Society of New South Wales," vol. v., No. 3; "Notes for Collections," issued by the Australian Museum; "Transactions of the Royal Society of New South Wales," vol. xxiv., No. 2; "Bulletin III. of the Victorian Department of Agriculture," and the "Quarterly Journal of the Mining Department," September, 1890.

The following were the principal exhibits of the evening:—By Mr. E. Anderson.—Butterflies and moths from Mt. Macedon (Tortrices, *Procris doloris*, *Chrysolarentia conifasciata*, &c.) By Miss Cochrane.—Seaweed, shells, and sketches (representing a week's work at Sorrento). By Dr. Arthur Dendy.—Land planarians (*Geoplana howittii*, *G. lucasi*, *G. quadrangulata*, *G. frostii*, *G. alba*, and *G. sulphurea*); Water Lizard (*Physignathus howittii*) and birds—Shining Flycatcher (*Myiagra nitida*), New South Wales Oriole (*Mimeta viridis*), Grey Crow Shrike (*Strepera anaphonensis*), Nankeen Night Heron (*Nycticorax culedonicus*), all

from Mt. Wellington district; also photographs and lantern slides illustrative of the visit to the Mt. Wellington district. By Rev. W. Fielder.—Land planarians from Mt. Macedon (*Geoplana alba*, *G. adæ*, *G. sugdeni*, *G. hoggii*, *G. fletcheri*, *G. medio-lineata*, and *G. quadrangulata*), and a peripatus (*insignis*). By Mrs. Flatow.—A Queensland bean. By Mr. C. French, jun.—Nest and eggs of Spiny-cheeked Honey-eater, taken near Bacchus Marsh. By Mr. G. A. Keartland.—Eggs of Little Eagle (*Aquila morphoroides*), Allied Kite (*Milvus affinis*), Rose-breasted Cockatoo (*Plectolophus roseicapilla*), Black-tailed Tribonyx (*Tribonyx ventralis*), and another Tribonyx. By Mr. A. H. S. Lucas.—Rare species of lizard (*Amphibolurus angulifer*), new frog (*Limnodynastes nigro-lutea*), fish (*Galaxias lacustris*), crayfish (*Astacopsis serratus*, var. *wellingtonensis*) ; and some dried specimens of plants from Mount Wellington district. By Baron von Mueller.—A plant new to science from Western Australia (*Anthrocroche healiana*, F. v. M.) By Mr. D. Le Souëf.—Insects from Plenty River district. By Mr. F. Spry.—A case of Queensland and Victorian butterflies, and seven specimens of Queensland birds.

The ordinary monthly meeting of the Club was held in the Royal Society's Hall on the 9th March, Mr. D. Best occupying the chair.

The minutes of the last meeting having been confirmed, Mr. F. G. A. Barnard brought forward a report of the excursion to Heidelberg, which took place on 4th February, and which suffered in every respect from the exceptionally hot weather experienced on that day.

The usual reading of papers then took place, the first being contributed by Mr. J. Lidgett. This had reference to the "Sagacity of Insects," the Ichneumonidæ serving as types, and the habit of depositing their eggs in living caterpillars, which act as hosts till the young Ichneumons can shift for themselves, was specially dwelt upon. Next came a paper by Mr. C. French, F.L.S., on "The Australian Bustard," the first of a series on "The Insectivorous Birds of Australia." In introducing his subject, the author referred to the indiscriminate destruction of insectivorous birds, and showed how nature maintains a balance between the numbers of birds, beasts, insects, and plants in any district, and if by artificial means this balance is destroyed, intolerable numbers of some kinds remain to work their ravages, and necessitate expenditure of money and labour to restore the balance again. Then means by which this wholesale destruction may be checked were discussed, and amongst others the following were advocated:—The formation of a collection of stuffed

specimens of insectivorous birds, together with their eggs, so arranged that any person may see at a glance the particular birds which it is desirable to protect; a series of charts in schools, which would enable children to discriminate between those which are useful and those destructive; and a vigorous administration of the present game laws. Some discussion followed, in which the Rev. J. J. Halley and Mr. G. A. Keartland joined, the former advocating a series of lectures at various centres, with a liberal use of lantern slides, showing not only the birds which should be protected, but also the insects upon which they prey.

The next paper, contributed by Mr. Nicholas Holtz, dealt with "An Acrid Secretion from the Seeds of a Species of *Grevillea*." The secretion, which is powerful enough to produce sores the scars of which remain for many months after, is thought to be useful in preserving the seeds from the attacks of cockatoos. Some useful generalizations followed upon the connection existing between the fruits of different species of the eucalyptus and the beaks of cockatoos, special deductions being made as to variations which must have proved useful in developing present forms.

Some interesting natural history notes were communicated to the club. Mr. A. J. Campbell sent one on the "Occurrence of the Comb-crested Parra in Victoria," Mr. E. H. Hennell on "How Flies Die," &c., Mr. G. Lyell, jun., on "The Impaling of Butterflies on Thistles," and Mr. G. Renner on "The Earthworm" and "A New Potato Disease."

The hon. librarian reported the following additions to the library:—"Quarterly Mining Reports issued by the Victorian Government," December, 1890; "Proceedings of the Australian Association for the Advancement of Science," vol. ii.; "Proceedings of the Field Naturalists' Section of the Royal Society of South Australia," 1889-90; "List of Named Insects in the South Australian Museum," third series; "List of West Australian Birds;" "Notes on West Australian Oology;" "Notes on Zoology of Houtman's Abrollos;" "Proceedings of Minnesota Academy of Natural Science," vol. iii., part 1, 1883-6; "Proceedings of Boston Society of Natural History," vol. xxiv., parts 2 and 3; "Reports from Smithsonian Institution," 1886, part 2; 1887, part 2.

The following is a list of exhibits:—By Mr. F. G. A. Barnard.—Rare Wood-feeding Moth (genus *Hepialus*), from Dandenong Ranges. By Mr. A. Coles.—A Blackfish (mounted), from River Tarwin. By Mr. J. E. Dixon.—Rare spiders' cocoons (three varieties), from Oakleigh. By Rev. W. Fielder.—*Hydra* (brown variety) and freshwater Polyzoa, from St. Kilda. By Mr. C. French, sen.—Specimen of Wild Turkey and eggs (in illustration

of paper) and the Comb-crested Parra. By Mr. C. French, jun.—A rare orchid (*Spiranthes australis*), from Cheltenham. By Mr. E. H. Hennell.—*Locusta virgentissima*, from Macorna. By Mr. J. Kershaw.—Collection of Australian longicornia. By Baron von Mueller.—Botanical specimens from Mt. Bartle Frere, N. Queensland, adding three genera to the records of the flora of Australia, and two being new to science—*Drimys semecarpoides*, *Haplostichanthus johnsoni*, *Ceratopetalum virchowii*, *Quintinia quattrefagesii*, *Schisto-carpea johnsoni*, *Voacanga roweniana*, *Bladzia pachyrhachis*, *Hemigenia croniiniana*, *Smilax chartinophylla*, *Schelhammera pedunculata*; also an Atlas of Diatomaceæ, by A. Schmidt. By Mr. J. Searle.—Lizards, spiders, and insects, collected on the Yarra Falls excursion; also a snake from W. Australia. By Mr. F. Spry.—Some rare butterflies—*Ialmenus myrsilus*, from Healesville; *Ogyris obiota* and larva, from Oakleigh.

The ordinary monthly meeting of the Field Naturalists' Club took place in the Royal Society's Hall on Monday evening, 13th April, Professor W. Baldwin Spencer occupying the chair.

A report of a recent excursion to Ferntree Gully was read by Dr. Arthur Dendy, F.L.S., and referred to the success of the party in obtaining a good many specimens of land planarians (a new species being recorded), a large number of a somewhat rare nemertine worm, and the Australian representatives of the interesting genus *Peripatus* found by Mr. E. H. Hennell, who also obtained a few lizards.

The first paper was communicated by the Rev. Dr. Woolls, of Sydney, and treated of "The Destruction of Eucalypts." Having discussed the various agencies of destruction, both natural and artificial, the writer proceeded to urge the need of the future preservation of this class of timber on account of its economic, medicinal, and hygienic value. Messrs. A. T. Campbell, F.L.S., G. S. Perrin, F.L.S., D. Le Souëf, T. Steel, H. T. Tisdall, F.L.S., and F. Wisewould joined in the discussion which followed, and many facts of interest were brought forward, Mr. Perrin especially alluding to the destructive action of frost upon eucalypts, as instanced by a track extending from Mount Gambier (South Australia) across the border to Portland and Warrnambool, and from Baw Baw to Rosedale, then into Tasmania, from La Perouse to Lake St. Clair, which has suffered from this cause.

Mr. R. S. Sugars was the author of the second paper, which gave an account of "A Trip to Sassafras Gully." A track through the gully, recently cut by the conservator of forests for the convenience of tourists, proved of immense service to the excursion-

ists, and although they missed seeing the giant gum known as "The Baron," the excellent photographs, exhibited in illustration of the paper, gave evidence that this somewhat unknown stretch of country contains glade and scrub of extreme beauty, which will well repay a much longer sojourn than the present party was able to give.

Amongst the natural history notes received was one by Mr. A. J. Campbell, F.L.S., on "The Breeding Haunts of the White Ibis," the Australian representative of the sacred ibis of the Egyptians. The graphic description of the Ibis "rookery" or nursery and its surroundings, on the Lower Murray, should excite the interest of every ornithologist of the Club. Mr. F. A. A. Skuse, of the Australian Museum, commented on Mr. Thomas Steel's recent paper on "The New Zealand Vegetable Caterpillar;" whilst other notes, interesting to agriculturists, treated of a new remedy against the Phylloxera (the application of dross from the smelting furnaces of iron works) and "The Grasshopper Parasite."

The following gentlemen were elected as members of the Club:—Messrs. G. M. Simmons, W. Mann, and G. W. Maxwell.

The hon. librarian reported the following additions to the library:—"Iconography of Australian Salsolaceous Plants," decades 1-6; "New Zealand Journal of Science," i., 2; "Pharmaceutical Journal of New South Wales," February, 1891; "Journal of New York Microscopical Society," vii., 1; "Catalogue of Australian Birds," part iii.—Psittaci; "Proceedings of the Linnæan Society of New South Wales," iv. and v.; "Journal of Pharmacy," March, 1891; "Transactions of Geographical Society of Australasia (Victoria Branch)," viii., 2.

The meeting terminated with the usual *conversazione*, the exhibits being:—By Messrs. A. J. Campbell and R. S. Sugars.—Photographs of Sassafras Creek. By the Rev. W. Fielder.—Land planarians and nemertine worms from Ferntree Gully. By Mr. C. French, jun.—Eggs of the Graceful Tern, from Western Australia. By Mr. E. H. Hennell.—Beetles and lizards from Ferntree Gully, and lizard from Corranwarrabul. — By Mr. A. C. Macdonald.—Insects, &c., collected by the Mount Yule expedition. By Baron von Mueller.—Rare or new plants collected during the Mount Yule expedition.—Drimys, Piper, Nepenthes, Ternstroemia britteniana, Aristotelia gaultierea, Sloanea, Saurania, Cupania, Rubus diclinis, Myrtus, Gunnera macrophylla, Symplocos, Rhododendron macgregoriae, Dendrobium, Freycinetia, and Dawsonia.

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#### REPORT OF TRIP TO PLENTY RIVER, 20TH DEC., 1890.

NINE members joined in this excursion to the Plenty River, and the weather was all that could be desired. On alighting at Preston station, a cab was procured, which took the party some

four miles along the Yan Yean road, and put them down within about a mile from the river. Several fields of stubble, from which the crop had been recently cut, were passed through, but the only insects captured there were the small cicadas, which were numerous. Shortly before reaching the stream, several nests of the Red-eyebrowed Finch were found, but all the nests had young in them. On the rocks and the banks of the river numerous wasps' nests, with larvæ in, were found hanging in sheltered places, some were also found hanging on the bracken fern. The shrubs *Leptospermum scoparium*, *L. lanigerum*, and the *Kunzea peduncularis* were in full flower, and attracted a number of insects, but mostly of well-known kinds; and although a vigorous search was kept up during the afternoon, no rare beetles were found, nor were as many different species obtained as were expected. Close by the river, in the branches of *Prostanthera lasiantha*, the nest of the Yellow-tufted Honey-eater was found, with three fresh eggs in. The nest was beautifully covered on the outside with bright green moss. Another nest of the same species was also found during the afternoon, and also that of the Wood Swallow and Welcome, but both had young birds in. The principal birds noted were the Pallid Cuckoo, Bronze Cuckoo, Black Fantail, Brown Hawk, Wood Swallow, Musk Lorikeet, Rosella Parrot, Red-eyebrowed Finch, Yellow-tufted Honey-eater, and Lunulated Honey-eater. The flowering plants seen were the *Linum marginale* (or Native Flax), the *Viminaria denudata*, *Glycine clandestina*, *Leptospermum lanigerum*, *Kunzea peduncularis*, *Callistemon salignus* (or Bottle Brush), *Eucalyptus amygdalina*, *Wahlenbergia gracilis* (or Blue Bell), *Goodenia ovata*, *Prostanthera lasiantha*, *Ajuga australis*, and the *Dipodium punctatum* orchid. The party walked back to the Preston station, and only just caught their train, having had a most enjoyable outing.

D. LE SOUEF.

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#### EXCURSION REPORT, HEIDELBERG, 14TH FEB., 1891.

CONSIDERING that this was one of the hottest days of the season and the Melbourne Observatory record was  $100.5^{\circ}$  in the shade, the attendance was as large as could be expected, and consisted of the leader (Mr. F. G. A. Barnard) and one follower. The party went to Heidelberg, and, making towards the Yarra, gave up the idea of collecting for that of observing, and interested themselves for some time watching the movements of a family of Blue Wrens among the branches of the silver wattle. A try was then made on some *Bursaria* for insects, but it was too hot for them even. Some specimens of Horsfield's Bush Lark were seen, not far from the Heidelberg Park. The party returned to town by an early train, rather exhausted by the strong north wind and heat.

NOTES ON THE INSECTIVOROUS BIRDS OF  
VICTORIA.—PART I.

By C. FRENCH, F.L.S., F.R.H.S., Government Entomologist.

*(Read before the Field Naturalists' Club of Victoria, 9th March  
1891.)*

## THE AUSTRALIAN BUSTARD, OR WILD TURKEY.

MR. CHAIRMAN, LADIES, AND GENTLEMEN,—There is an old tale, known, I suspect, to most of you, that the average travelling Englishman may be easily distinguished from most foreigners, owing to some of the questions which he is said to ask when, for the first time, he sets his foot in a new country—*e.g.*, “Is there anything to shoot?” Now, as an Englishman myself, with but little love for indiscriminate shooting, I cannot but admit that this abominable love of killing, either by shooting or other means, seems to be with us quite an inheritance, for, go where you will, one seldom meets a “Britisher,” on travel bent, who is not well provided with gun and ammunition, and, as a rule—there are, of course, a few honourable exceptions—he is bent upon having some “sport,” and is not all particular as to what he shoots, whether it be the humble insect-eating and homely little Robin or an elephant, and seldom pauses to inquire whether the animal is useful or otherwise—it is all one to him; and should he possess the necessary accuracy of aim, combined with a steady nerve, few animals—be they quadrupeds or birds—escape his murderous intentions. As one who has passed thirty-seven odd years of his life in Victoria, and had many opportunities of making observations both in the vicinity of cities as well as in the bush, I am afraid that we in the colonies are, so far as the habit of indiscriminate shooting goes, not one whit better than our English brethren; so we had better be as modest as possible under the circumstances and gradually admit our faults, at least in this respect. Long before the Government of this colony had done me the honour of entrusting to my care the management of the Entomological Department I had often been impressed with the urgent necessity of something being done towards the formation of a distinct named collection of the insectivorous birds of the colony, so placed and arranged that any farmer, vigneron, or orchardist could be able, when he came to town, by means of a collection of stuffed specimens, together with their eggs, properly named, grouped together, and easily accessible, to distinguish at a glance any particular kind of bird that it would be desirable to protect from the itinerant sportsman and others. This much, through the liberality of the Government, supported by the Secretary for Agriculture, I have been able to do; and although the collection is by no means perfect, I hope, with the assistance of some

ornithological friends, to be able to render the collection tolerably complete. The same remarks will apply to the noxious insects of the colony. The collection of these, in a practical and comprehensive manner, will, it is hoped, be of great use to growers generally. To all engaged in either farming or fruit-growing, the preservation of our useful friends, the insect-destroying birds, is, in my opinion, of the very greatest importance. Nature maintains a balance between the numbers of the birds, beasts, insects, plants, &c., in any district. If, by artificial means, we destroy this balance, immediately intolerable numbers of some kinds remain with us, and we have to expend much money and labour to rid ourselves of the swarms which nature was ready to dispose of for us gratis.

Some writer has well said, as quoted by Mr. Tryon in his valuable book on the fungus and insect pests of Queensland :—"If the arrangements of nature were left undisturbed, the result would be a wholesome equilibrium of destruction. The birds would kill so many insects that the insects could not kill too many plants. One class is a match for the other. A certain insect was found to lay 2,000 eggs, but a single tomtit was found to eat 200,000 eggs in a year. A swallow devours 543 insects in a day, eggs and all." There is the whole case in a nutshell. The birds will do yeoman service and ask for no wages. The question will naturally be asked, how, and by what means is the wholesale destruction of our insectivorous birds to be checked? This would seem to be a somewhat difficult question to answer, for have we not already game laws? But are they carried out? I am afraid not, as the formidable array of many of the protected birds to be seen in the hands of the holiday sportsman, and at many of our leading poultry shops will testify, and thus the good intentions of those by whom the laws were introduced and framed have been frustrated. To secure active co-operation in the direction of the preservation of insectivorous birds, we must be able, by the aid of stuffed specimens themselves, to show those interested the difference between the noxious and the beneficial kinds, and to point out to those persons who are engaged in our great rural industries that their interest lies in uniting, as in the case of the insect pests, to maintain the balance which nature has given us, and more especially to endeavour to impress upon young people the necessity for preserving certain birds from destruction. Those unaccustomed to dissecting birds can have but a faint idea of the enormous quantity of insects many even of the smaller birds devour, and a better acquaintance with both birds and insects would, I am sure, tend to prevent such wholesale slaughter. The chief enemies of birds are the itinerant sportsmen, who on holidays scour the country in all directions,

until very little is left of the bird-life of former days. In the case of such birds as parrots, leatherheads, sparrows, &c., which are destructive to either fruit or grain, those interested will of course know best how to deal with them. But a very large number of our native birds feed solely on insects, and every such bird is always on the watch to protect the farmers' crops. Let this fact be once realized by the rural population, and there will be a chance of saving the birds. If once the birds become extinct here, it will be almost, perhaps, impossible to replace them.

The excellent charts in the schools, which should be at once added to, ought to be the means of enabling persons to distinguish many kinds of birds which should be protected and preserved as being of essential service to all cultivators. The importation, under proper supervision, of the insect-destroying birds of other countries, would also be advantageous; but, in so doing, great care must be taken to make sure of the particular kinds we propose to introduce, so as to enable us to guard against a repetition of former and often disastrous mistakes, as in the case of the sparrow and festive rabbit, foxes, &c. In the matter of selecting and naming the birds, I have been assisted by Messrs. A. J. Campbell, D. Le Souef, and A. Coles, all members of our Field Club, and to these gentlemen—also to another member, Mr. Keartland—I am indebted for much valuable information, as well as for occasional specimens of birds oftentimes difficult to obtain elsewhere. The collection of eggs, and, where practicable, the nests also, have been presented by my son, C. French, jun.—the latter collection being especially useful in drawing the attention of farmers' sons and others to the great harm done by the indiscriminate egg-hunter. These collections may be seen by those interested at the little museum attached to the offices of the Government Entomologist, at the Exhibition Buildings, Melbourne, where all information concerning the birds or their eggs may be obtained. The number of kinds already in the collection being about 98; number of specimens, 120. In preparing these fragmentary notes, I have determined to commence with a brief account of the birds which, in my opinion, stand first as destroyers of insects, laying aside on this occasion all sequence in general ornithological classification, so will commence with that giant amongst our insect-destroying birds, the Australian Bustard, or Wild Turkey.

ORDER VII.—*Grallæ. Waders or Stilt-walkers.*

FAMILY—*Otididæ. Bustards.*

*Choriotis australis* (The Australian Bustard or Wild Turkey).

This splendid bird, a fine specimen of which I exhibit here this evening, is to be found chiefly in the northern, western, and

north-western parts of the colony, but of late years, owing to the great havoc which has been made amongst them by professional duck-shooters and others, it has become comparatively scarce in most parts of Victoria, the gradually increasing settlement of the land having no doubt been partly the cause of such large numbers of these birds having been killed, but the main cause has been the large demand for them as a "bird for the table," and it was but a few weeks ago no uncommon sight to witness a dozen or so of these useful and fast disappearing creatures hanging outside fishmongers' shops in Melbourne.

In the early days of the colony, persons who for business or pleasure (perhaps for both) had to cross the dreary plains of the Wimmera country might have come across large droves of these wild turkeys, and although a remarkably shy bird, and somewhat difficult of approach by man if on foot, it might easily be "stalked" by persons either on horseback or in a conveyance, the latter being, as a rule, the method usually adopted for their destruction. The aborigines, however, stalk them with a screen made of green branches. The flight of the Australian bustard is sometimes heavy and laboured, and in the "locust season" the bustards are so gorged with these destructive insects that flight is rendered somewhat difficult and often impossible, and at this time they fall an easy prey to the so-called, but sadly misnamed, sportsman.

On the vast plains of New South Wales, especially in the country bordering on the Murrumbidgee river, these birds are still to be found in great numbers, although quantities have been destroyed by means of poison laid for rabbits, and in some parts of Queensland, no doubt, they are fairly plentiful, but in Victoria it must be a source of regret to all interested that the Bustard, if not carefully watched and protected, will soon be well-nigh extinct. Mr. Layard, in his excellent book on the birds of South Africa, tell us of thirteen species of the genus *Otis* or Bustards as inhabiting South Africa, the largest of which, *O. kori*, has turned the scale at from sixty to seventy lbs., and the stomach found to be perfectly crammed with locusts.

The celebrated ornithologist Gould, in his "Handbook to the Birds of Australia," remarks that "a country better adapted than Australia for the members of this family can scarcely be imagined; yet singularly enough only one species has as yet been found there. Africa is the country where the species are most numerous; the *Choriotis edwardii*, of the plains of Upper India, and the *C. australis* are beautiful representatives of each other in their respective countries."

The abovenamed and celebrated naturalist also gives it as his opinion that the Wild Turkey is merely a summer visitant to

the more southern parts of the Australian continent, but I must leave this question to be settled by someone better versed in ornithology than myself, although notes on the geographical distribution of any particular animal, no matter of what kind, are always of interest to the naturalist, and not infrequently to those also engaged in rural industries, &c., &c.

The size of the Wild Turkey as given by Gould in his "Handbook," vol. ii., p. 209, is—total length, 40 inches ; bill, 4 ; wing, 25 ; tail, 10 ; tarsi, 7½. A good male specimen of our Bustard, if fattened on locusts, will turn the scale at from 20 to 30 lbs.

The eggs of the Wild Turkey are olive brown (see specimens exhibited here this evening), and Dr. Ramsay tells us that they vary both in shape and colour, and are deposited by the female bird on the bare ground. The eggs are mostly laid in pairs, but Dr. Ramsay says that "in the Dobroyde collection there are twenty-four eggs, and of these eight sets were found in pairs, and the eggs of this bird are occasionally found of a pale sky-blue tint."

When hatched from the egg about two days the young turkey is about the size of an ordinary chicken of a couple of weeks old, colour light drab, with blackish-brown irregular markings, the rudimentary wings hanging very low, and being quite limp. When in a sitting posture the "chick" has a similar attitude to that of a young duckling, the head lying well back, until the back of the head almost touches the body between the wings. (The above brief description of the young bird I have noted from a specimen kindly lent for examination by Mr. Pearman, of Brighton, who obtained it on his station in one of the northern parts of the colony, and as Gould in his "Handbook of Australian Birds" does not make mention of the young bird, and no specimen being in the fine collection of Australian birds at our National Museum, I trust that the very brief description here given may not be without interest.)

I had almost omitted to mention that the male bird is larger and more majestic looking than the female, the latter being minus the singular plume-like ruffles so noticeable in male specimens of this fine bird.

The Australian Bustard then would appear, according to Dr. Ramsay, as quoted in Mr. A. J. North's book on "Australian Oology," to have a wide geographical range, having been found at Derby (North-West Australia), Gulf of Carpentaria, Cape York, Rockingham Bay, Port Denison, Wide Bay District, Dawson River, Richmond, and Clarence districts (New South Wales), interior of Victoria, South Australia, West and South-West Australia.

The bird breeds during September, October, and November ;

the incubating months being, according to Mr. A. J. Campbell in his book on "Oology of Australian Birds," from August to January.

Having told you a little about the bird itself, as also its eggs, young, habits, &c., it may interest you to know that within the last few months I have made an appeal (through the Secretary for Agriculture) to the Government, asking that this, the most useful insect-destroying bird in the colony, might be permanently protected, and at the same time suggesting that the Governments of the other colonies be asked to join in the good work. This appeal, it will be gratifying to the Club to know, has been consistently supported by the Council of the Zoological Society in Melbourne; the result being that the Government have been pleased to accede to my request, and have, I understand, placed the matter before the Government of New South Wales, who, it is to be hoped, will at once see the necessity for the preservation of so valuable a bird.

It must be a matter of congratulation to members of the Field Naturalists' Club that the extension of our game laws, and the addition of the majority of the useful birds, is to be ascribed to the labours of certain members of this Club, backed up by the Zoological Society; and in the opinion of the writer of these notes, the farmers, vigneron, and fruit-growers of this colony owe the above societies a deep debt of gratitude for having drawn their attention, before it was too late, to the probable destruction of the most useful of our insect-destroying birds.

It may not be out of place to mention here that a very interesting paper is to be found on page 471 of "The Proceedings of the Zoological Society of London for the Year 1868," on "Observations concerning the Presence and Function of the Gular Pouch in *Otis kori* and *Otis australis*," by James Murie. Another paper, also of much interest, was read on the 23rd May, 1874, before the Zoological Society of London, by A. H. Garrod, "On the 'Showing Off' of the Australian Bustard (*Europodotis australis*)."

The only, and probably the most difficult, matter to be dealt with now is to see that the law, as determined by the Honourable the Commissioner of Customs, in whose hands the administration of the Game Act lies, is strictly carried out; and in my letter communicated to the Government, I have suggested a certain course which will, I trust, have the desired effect. The locust scourge has been, and now is, a terrible one, and it behoves all of us to do even a little whereby the pest, which, if it cannot altogether be eradicated, may be kept within reasonable and manageable limits.

No. II. will treat of the Southern Stone Plover (*Ædicnemus grallarius*) and the Tawny-shouldered Podargus (*Podargus strigoides*).

DESCRIPTIONS OF NEW AUSTRALIAN PLANTS, WITH  
OCCASIONAL OTHER ANNOTATIONS;

BY BARON VON MUELLER, K.C.M.G., M. & PH.D., F.R.S.

(Continued.)

DRIMYS SEMECARPOIDES.

Arborescent; leaves large, on conspicuous petioles, chartaceous, glabrous, from ovate- to elongate-elliptic, but gradually narrowed into a cuneate base, rounded-blunt at the summit, very grey on the under side, punctular-rough, the costular venules very thin, the secondary venules much concealed; peduncles elongated, glabrous; sepals two, very small, roundish; fruitlets solitarily ripening, almost globular.

On Russell's Creek; W. Sayer.

Tree attaining a height of 25 feet. Leaves to 8 inches long and to  $2\frac{1}{2}$  inches broad, not very aromatic. Petioles often 1 inch long. Peduncles to 3 inches long. Pedicels few or two or even solitary. Flowers unknown. Ripe fruitlets of  $\frac{1}{4}$ - $\frac{1}{3}$  inch measurement.

To this plant or an allied was alluded already in the "Fragm. Phytogr. Austr." vii. 18.

This species differs from *D. Howeana* in almost entire absence of aroma, in leaves of larger size, of thinner texture, of far less prominent venulation and with the dots not transparent, in the perfect separation of the sepals and probably also in characteristics of the flowers. It comes very near to *Drimys rivularis* (Vieillard) of New Caledonia, but the petioles are much longer, the venules of the leaves more occult, the inflorescence is less ramified, the ovararies are fewer, and also in this case the flowers, which in an only specimen available here for comparison are not developed, may be different.

BLADHIA PACHYRRHACHIS.

(*Ardisia pachyrrhachis*, F. v. M. collect.)

Arborescent, glabrous; leaves of firm texture, on very short petioles, elongate-lanceolar, rather blunt, towards the base cuneate, entire, devoid of lustre, the venules faint or almost concealed; flowers in solitary terminal fascicles; peduncles robust, rather short or even obliterated; rachis often somewhat elongated, remarkably thick; pedicels many times longer than the flowers, often numerous; calyx very small, its lobes semiorbicular-deltoid; corolla deeply five-cleft, its divisions about twice as long as their breadth, acuminate; filaments extremely short; anthers pale,

somewhat cordate-sagittate, rather more than half as long as the corolla ; style subulate ; fruit moderately large, globular.

In the upper region of Mount Bartle-Frere; Stephen Johnson.

Greatest height known, 15 feet. Leaves to 8 inches long and to  $1\frac{1}{2}$  inches broad ; pellucid streaks or dots scarcely perceptible. Peduncle about half an inch long, bearing small deciduous leaves. Rachis usually about  $\frac{1}{3}$  inch long and  $\frac{1}{6}$  inch broad, cicatricous. Pedicels at an average 1 inch long, very thin, up to 40 in a fascicle, at first bent downward. Corolla of about  $\frac{1}{6}$  inch length, copiously spotted by purplish-black dots or short streaks, before expansion distinctly twisted. Anthers pointed. Style nearly  $\frac{1}{8}$  inch long. Fruit of  $\frac{1}{4}$ - $\frac{1}{3}$  inch measurement.

This species offers some approach to *Myrsine*. It differs from *B. brevipedata* (*Ardisia brevipedata*) already in larger, thicker and blunter leaves with much concealed dots, in the stout and more elongated rachis of the fascicle of flowers, also in much longer and more rigid pedicels.

*B. pseudo-jambosa* is more distant. It seems quite distinct from any of the numerous Asiatic Bladhias, unless *B. reclinata* and *B. Amboinensis* (*Ardisia reclinata* and *A. Amboinensis*, Scheffer, Commentatio de Myrsinaceis Archipelagi. Indici 69 et 75).

By the right of precedence all the Ardisias have to change their names into Bladhias, as Thunberg established that genus seven years before Swartz defined and published Ardisia.

Mr. Johnson's collections contain, among rarer plants, also *Zieria obcordata*, *Drosera Adelae*, as a variety with cuneate obovate leaves, fully to  $1\frac{2}{3}$  inches broad, and with somewhat pubescent calyxes, *Loranthus dictyophlebeus* with undular-marginate leaves, and *Exocarya scleroides*. In the same region occurs *Andropogon Baileyi* (*Sorghum laxiflorum*, Bailey in Report on the Expedition to the Bellenden-Ker's Ranges 25); the latter specific name has long since been utilized by Steudel for a species of the section *Trachypogon*. The leading agrostographer of the present days, Professor Ed. Hackel, also subjugates the genus *Sorghum* to *Andropogon*.

(To be continued.)

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#### NOTICE.

THE number of this journal entitled No. 87, March, 1891, should be entitled Nos. 87-88, March-April, 1891. The issue thus constitutes Nos. 11-12 of vol. vii.

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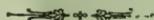
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VOL. VIII.—NOS. 2 AND 3.

JUNE-JULY, 1891.

# The Victorian Naturalist:

THE JOURNAL AND MAGAZINE

— OF —

The Field Naturalists' Club of Victoria.

PUBLISHED JUNE 13, 1891.

The Author of each article is responsible for the facts and opinions he records.

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VOL. VIII.—Nos. 2–3. JUNE–JULY, 1891.

Nos. 90–91.

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A VISIT TO LAKE NIGOTHORUK AND THE MOUNT WELLINGTON DISTRICT, GIPPSLAND.

By A. W. HOWITT, F.G.S., A. H. S. LUCAS, M.A., B.Sc.,  
AND ARTHUR DENDY, D.Sc., F.L.S.

(*Read before the Field Naturalists' Club of Victoria, 9th February, 1891.*)

IT is now pretty generally known that there is a mountain lake in North Gippsland, sheltered and hidden by the spurs and hills around Mount Wellington. This lake was unknown even to the blackfellows until somewhere about fifty years ago, when two natives of the Welwenduk tribe came upon it while in search of wombats. The district claimed as its particular and private hunting and foraging ground by each of the Gippsland tribes was defined by the watersheds between the different rivers. Thus, the Bundaurat tribe owned all rights of the Macallister basin, including the basin of the Wellington, which is a tributary. The Nigothoruk (Wellington Mountain) blacks claimed the neighbouring valley on the east, that of the Avon and its tributaries, which drain the plains over Mount Wellington. It was the Welwenduk division of this tribe, which occupied the lower Avon, to which "Billy" and his father, the discoverers of the lake, belonged. They observed that while a stream ran down into the lake from the plains belonging to the upper division of their tribe, there was no communication to be seen between the lake and the Wellington River and territory of the Bundaurat. They accordingly annexed the lake as very properly belonging to them, and made use of it until the time when, early in the fifties, the native police raided the Gippsland blacks and ejected them from their various lands.

No white man had seen the lake until in 1886 a stockman named Snowden, working up the Wellington valley, saw the lake from the top of a spur, visited it, and made known its existence.

In the same year Mr. Howitt made a first attempt, with old Billy as a guide, to reach this "big fellow waterhole what creek go in and never come out again." They tried first to follow the ridge between Ben Cruachan Creek and the Avon River, but were forced back by bad weather. They twice afterwards endeavoured to force a way along the Mount Angus Range, on the east side of the Avon, but the country was so rugged that a horse's shoe was pulled off, and the explorers had to return as best they could. The horse was lame for three months after-

wards. Meanwhile news came of Snowden's success, and that Mr. Riggall, of Glen Falloch station, had also reached the lake. Accordingly Mr. Howitt saw that the Macallister and Wellington route was the most practicable, and in a fourth attempt succeeded in reaching the lake with his black friend, at Easter, 1887. Mr. Howitt published accounts of his trip in the papers, and others were now tempted to visit this remarkable district. Mr. Riggall took up a party of thirty ; they led down, however, only a single pack-horse to the lake. The Misses May and Annie Howitt, with their father, at Christmas time, 1887, made another vain attempt to reach the goal by way of the Mount Angus Range, but in the following February, 1888, they were successful, taking this time the Macallister route, and rode triumphantly down to the shores of the lake, where we found evidence of their visit in certain commemorative inscriptions.

It was seen then that the lake was held up in the valley by a comparatively low and level barrier of rocky boulders. It resembled nothing else of the kind known in Australia, but called to mind the lakes of mountain districts in Europe, lying in a rock-basin deeper in the middle than at the upper or the lower ends, but with the further peculiarity that, while one creek was constantly running into the upper end, and another clearly brought in floods of rain and melted snow at intervals, there was no outlet at all visible. The camping-ground at the lake is desperately bad for horses, from its stony nature and lack of feed, and Mr. Howitt was unable to examine fully the nature of the barrier, or to descend the valley below in order to discover the mode of issue of the water. The glaciation of the Australian Alps has been a favourite topic of late years with our geologists, and while the evidence hitherto brought forward of the existence of glaciers in former times consisted only in boulders and striations of the rocks, it seemed at first as if here was magnificent testimony in the shape of a tarn held up by the terminal moraine of a glacier in the basin which the glacier had excavated out of its rocky bed. Such evidence would be decisive, and it became a matter of importance to make a close investigation of the barrier and of the valley below.

Mr. Howitt had mentioned the matter to the other members of the party, who felt considerable interest in the geological problem, and who gladly agreed to join him in a fresh expedition, having the further hope of making some good zoological finds in such an out-of-way locality. It was a ticklish sort of place to venture into, but we felt ourselves safe in the hands of such a veteran and accomplished bushman as Mr. Howitt.

Once or twice previously we had made our arrangements, but each time some unforeseen contingency prevented us from carrying out our intentions. At last, however, all three of us succeeded

in escaping from Melbourne together, and we set out joyfully for Heyfield on the 23rd of December, 1890. Two of us, Messrs. Lucas and Dendy, started by the early train, leaving Hawksburn station at 8 a.m., with the bulk of our impedimenta, while our leader, Mr. Howitt, was in this instance to be our follower by a later train and to meet us at Heyfield.

It was supposed to be the duty of the first arrivals to see the horses all safe in the paddock, and the luggage ready to pack for an early start next morning. We were met at the Heyfield station by Mr. Sewell, the proprietor of the Temperance Hotel, with an open trap. It was raining cats and dogs, and we waited a little while under cover at the station before we got into the buggy, which by this time had been fairly converted into a municipal water-cart. However, we arrived undrowned at the hotel, and were soon comfortably discussing the excellent Christmas dinner which Mrs. Sewell had prepared for us, and which we made the most of, as being the last dinner we expected to see for some days.

After dinner we had a short ramble by the Thomson River, which flows through the township; the bridge is close to Mr. Sewell's. We turned over sundry logs in quest of Peripatus and Planarians, but could find none. The ground being dry, we only saw a number of ants, and some females of the Golden Beetle, *Lamprima rutilans*, which one is more accustomed to meet with in that stage of their existence which is spent up amongst the gum leaves. We noticed a few Rosehill Parrots, and learnt that there are plenty of Long-necked Tortoises and fine trout (*Galaxias*) and blackfish in the river. The rain coming on again, we returned to the hotel to look after the packing.

It may be of interest to any members of the Club who propose to go on a similar expedition to know what we took with us. The objects we had in view were three—(1) to make a more complete exploration of the lake and its surroundings than had hitherto been made; (2) to take as complete a series of photographs as possible; and (3) to collect natural history specimens. Our baggage was accordingly somewhat elaborate. For the first object we had to take—(1) horses and horse furniture, (2) tents and clothing, (3) provisions, and for the others appropriate photographic and collecting apparatus.

We took with us three riding horses and three packers, and also a youth, who provided his own mount. Each of the packers was, of course, provided with a pack saddle, with surcingle, side straps, centre straps, and crupper, leading rope, bell, and hobbles. Each riding horse had, in addition to the ordinary saddle and harness, a bell and hobbles. We also took half a dozen horse-shoes (slippers) and shoeing tools, including "ready-pointed patent nails with countersunk heads," for our leader's abundant

experience had taught him that, on such an expedition as ours, one or more of the horses is certain to cast a shoe; and, moreover, we had very rocky ground to travel over. As a matter of fact, the shoeing operation had to be performed twice during the trip—we need hardly add, by our all-accomplished leader. For mending the harness (which was in a parlous condition, even at the start) we had a good supply of kangaroo leather boot laces.

We took an ordinary tent, 8 x 6, capable of holding two or three comfortably, and which one wet night sheltered the four of us, and a small fly-tent open on the fire side. When folded up, the tent and fly served as covers for two of the packs. Before starting we had provided ourselves with a large supply of American leather, for some of us knew by previous experience that a first, second, and third necessity in the Gippsland bush is waterproof. We found four yards of the leather each not too much, and manufactured out of it various strange and uncouth-looking garments to be worn on horseback in case of wet weather, and to lay on the ground at night to keep the damp from the blankets. We each had a "poncho," consisting of a large square of American leather with a slit cut in the middle to put the head through, and also an apron of the same material to protect the knees, and a valise of size convenient for strapping in front of the saddle in which to stow the private kit, consisting of change of linen and sundries. The balance of his leather was used by Mr. Lucas to secure his press from damp, and by Dr. Dendy to form a case of elegant shape for his gun. Of course we all had large blankets.

As to provisions, we were well supplied with flour and baking powder, beef and bacon, tongues and sardines, cheese and butter, figs and prunes, jam and marmalade, tea, coffee and cocoa, with sugar but no milk. As we unfortunately took some of these in tins instead of putting them all in linen or canvas bags, things did, we must own, get a trifle mixed, but we were well out in the bush and hungry before we found the coffee in the butter, the prunes in the marmalade, and the shoeing tools in the bacon. To all who propose to similarly sojourn in the wilderness we strongly commend our friends the prunes and figs. The only culinary utensils we took were a spoon, a tin-opener, and three sizes of "billy," so that the smaller packed in the larger. When our leader had occasion to bake he manufactured a beautifully clean white bread-board on the spot out of the bark of a white gum or other convenient tree by the deft use of a tomahawk. Each carried a pocket knife of formidable appearance. Our leader disbelieves in ardent spirits of any sort, and though the others each took a flask in case of emergency, neither of them was opened on the journey.

We took two cameras. Mr. Howitt's was a half-plate with a lens

of so extraordinarily wide an angle that we came to think it could take in objects behind the camera. Dr. Dendy's was a very convenient travelling stereoscopic camera. The former used Ilford dry plates, Carbutt films, and stripping films, and the latter Fry's dry plates. Mr. Howitt took what Dr. Dendy calls a diabolical invention known as a changing bag, and which he guarantees to produce more blasphemy in a given time than any other piece of scientific apparatus yet invented. The bag is made of two thicknesses of red cloth, and has three openings or sleeves, a single one at one end, and a pair at one side. In through the single opening are put the dark slides (containing the plates to be changed) and the box of fresh slides. Then the operator's hands are thrust into the two sleeves at the side, which clasp the wrists tightly by means of an elastic band, and there he sits on the ground, before beaming spectators, in the roasting sun maybe, or, worse, in the full smoke of the camp-fire, both hands tied up in an irritating red bag, while he fumbles about for an indefinite period, trying in vain to make the plates go into their proper places without getting confused, while the perspiration streams from his face, and his utterances are frequent, brief, and emphatic.

Our collecting apparatus was varied, consisting of a double-barrelled breech-loader and ammunition, fishing-rod and tackle, bird-skinning apparatus (scalpels, scissors, forceps, cotton-wool, arsenical soap, and fuller's earth), a few Mason's jars of two sizes, some containing methylated spirit, others spirit and a number (the large jars will hold about 50) of 1-ounce corked pill bottles containing spirit, and prevented from shaking overmuch by interposed cotton-wool, and a few small tin boxes for Planarians, &c. We also took corrosive sublimate and rectified and absolute alcohol, but they were not required. Our travelling was rather too rapid to make the gun of much use. Dr. Dendy shot a few birds and the river lizards, and later on some ducks; but there was not much encouragement to shoot birds which there was no time to skin while good. The fishing-rod was a particular nuisance to carry, as were the camera legs, and a sapling would have served our purpose just as well as the rod. As it was, the gun got rusty and the rod was smashed. Mr. Lucas took a press for plants which has now been a good many trips in the bush. Mr. Howitt's compass, aneroid, and geological hammer completed our scientific equipment.

But we have not yet started on our expedition, having been waiting for our leader at Heyfield. He arrived about 11 p.m., and after supper we turned in. Next morning our work began in earnest.

24TH DECEMBER (CHRISTMAS EVE).—We got up about 4.30 a.m., packed the horses, had breakfast, and rode away from Heyfield at 8 a.m. Our cavalcade consisted of our three selves on our respective horses, the boy Alfred (who was engaged as a kind of

handy man for the trip), the three pack-horses, and an escort comprising Mr. Du Ve, of Rosedale, who had kindly assisted us in making our arrangements, and Mr. Cox, the mounted constable in charge of the district, who rode with us to Glenmaggie, perhaps to see us safe off the premises. There was also an uninvited member of the expedition in the person of a collie dog belonging to the owner of the pack-horses, who would not leave us, but accompanied us right up to the lake. We never discovered his name, though we tried him with all the names in the (dog's) calendar. The various eccentricities of our horses soon began to show themselves. The chestnut which Mr. Howitt rode was a light, plucky little horse; although he started with a sore back, which necessitated a re-stuffing of the saddle before we set out from Heyfield, so successfully did our leader handle him that on his return the sore was cured. Mr. Lucas's mount was a big bay, strong enough for half a dozen, who made a very poor attempt at keeping to the easy paces of the chestnut, but for carrying two, or for forcing his way up a steep bank, he was unrivalled. Dr. Dendy bestrode a big brown horse, who was no doubt very useful in the lowlands, but was about as clumsy among the rocks as a Manchester cart-horse, and suffered in consequence, as will appear in the sequel. The boy's horse was a skewbald, and though decidedly "a rum 'un to look at," seemed to be also "a good 'un to go."

The three pack-horses we shall not soon forget. Boco was blind of one eye. Brownie had a "jinked back," i.e., was gone in the loins. Biddy went everywhere but on the track, and on coming to a tree took her pleasure in veering to the right if she saw you working to the left—a proceeding which leads to entanglement and unphilosophical language. But we shall discover more of the ways of packers as we proceed, and must not allow them to make us linger in our narrative as they did upon our journey.

We had first to leave the basin of the Thomson, and cross the low watershed which separates it from the basin of the Macallister, the Glenmaggie Creek being a tributary of the latter. The country between Heyfield and Glenmaggie is slightly undulating, and consists of sands, gravels, and conglomerates of the Upper Tertiaries. The timber is small and light, consisting in part of that poor creature, *Eucalyptus stuartiana*, the Apple-tree Gum, the wood of which is valueless even as fuel. Most of the birds—Leatherheads, Honey-eaters, &c.—seemed more or less familiar, and so did most of the plants of the underscrub. The most interesting plants that were new to us were the well-marked variety of *Trachymene billardieri*, called by the Baron von Mueller *cuneata*, the bushes of which were crowded with pretty white globular umbels; *Pomax umbellata*, which was in fruit; and a pink *Melaleuca*, which we failed to gather on our return.

Glenmaggie, eight miles from Heyfield, is rich in the surrounding river flats and cappings of old basalt on the hills above. Near it we entered on the Upper Silurian and more hilly country. Here we parted with our friends, and crossed the Glenmaggie Creek, more attracted by the big hills we could now see in the distance, than by the rather pretty little township. A big black snake lay across our road, which was broad enough to afford us glimpses of Biddy's peculiar style of tacking. After crossing another creek, our road lay along a long Silurian ridge, with occasional overlying tracts of basalt, which runs parallel to the Macallister River at a distance of one to two miles, and which culminates about a dozen miles to the north in the steep Blanket Hill. The contrast of the hard, yellow, bare Silurian and the soft, black, well-grassed basaltic soil appealed to the hoof as well as to the eye. The next hillside on our left presented a study in Eucalyptus foliage, the bright green leafage of the Stringybark (*E. macrorhynca*) alternating with the delicate blue of the Red Box (*E. polyanthema*). On the Blanket Hill we found the rare *Goodenia macmillani*, which has a purple corolla, unusual in the genus. A pair of Cockatoos screamed over our heads, but did not give a chance of a shot. In a swamp at the foot of the hill a bittern suffered at Dr. Dendy's hands, but though he waded till our leader showed restless (for he wanted to push on), it was in vain, and the doctor remounted looking damp as to the legs. We continued to skirt the left bank of the river, the track narrower but still good and well worn.

At 1.30 p.m. we made our first ford of the Macallister River, 21 miles from Heyfield. Here we camped for lunch, and the unaccustomed exercise began to show its effects very markedly on some of us. At this bend of the Macallister is the only unavoidable ford between Heyfield and Glen Falloch, and it seems a great pity that the authorities do not build a bridge here. When the river is high with rains it is a serious matter getting across. Here we met Mr. William Riggall riding down from Glen Falloch, and his was the last outsider's face we were to see for a week. After lunch we pushed on, keeping near the river, our leader jogging ahead, anxious to bring us to the lake in good time.

At Hickey's Creek we left the river, which here comes from a considerable westward bend, and shortly after entered upon a southward projecting tongue of the Upper Devonian. This formation constitutes the whole of the district of the Upper Macallister and the Wellington rivers, including Mounts Crinoline, Tamboritha, and Wellington. It sends southward, on the west, the tongue to Glen Falloch and Hickey's Creek, and on the east a much broader stretch of country, comprising the Avon valley with Mount Angus and Ben Cruachan. These summits, with Mount Useful to the east, formed the most conspicuous land-

marks on our journey. Mounts Wellington and Tamboritha are over 5,000 feet high, and the Crinoline Hill is of not much less elevation.

A ride through a thicket of beautifully green young wattles gave us some new experiences in pack-horse leading, but we were now getting into the spirit of the exercise, and rather enjoyed new difficulties and discomforts. We passed a huge boulder of old red sandstone on our left, lying at the foot of the hill-slope, called by the natives the "Boukan's" Rock. Next over the Big Hill to Glen Falloch, with magnificent views on either side. The Devonian sandstones and mudstones seemed to be generally bedded more or less horizontally, and the deep ravines into which we looked down were seen to be in many cases bounded by steep, nearly vertical walls, the harder beds of rock standing out in often overhanging terraces, while the flat outline of the mountains appeared to be fringed by a single row of trees, so clearly was the foliage of the gums which grew close to the edge of the precipice projected against the sky.

We did not stay at Glen Falloch, as we had a good hour of daylight available, notwithstanding the delay caused by one of us having dropped his valise, and having had to ride back up the hill for it. On the Big Hill we had sighted a kangaroo, and near the station we came on a pack of dingoes. One handsome animal seemed willing to stand and face being shot; but while the doctor was dismounting, our collie ran barking forward, and the dingo was off like the wind with the rest of the pack. We pushed on, after leaving Glen Falloch, keeping close to the river, and camped on Herald's Flat, at a spot about two miles below the confluence of the Wellington and Macallister, and four from Glen Falloch. Mr. Riggall had given us permission to make use of a large paddock, with plenty of good clover feed for the horses, and of bracken ferns for bed-making. We pitched our tents about 7 o'clock, and uncommonly glad we were to do so, after our long ride. About Glen Falloch are numerous waterholes and billabongs, and any quantity of black ducks, but we had no time for sport; our idea was to travel on as fast as we could in going, and to collect on the return journey.

25TH DECEMBER (CHRISTMAS DAY).—We were all up at about 4.30 a.m. Dr. Dendy walked over to the nearest waterhole to try for some wild duck, but returned with only a Wattle Bird, of which there were numbers in the tall trees. He had shot the bird for "Shepherd's" breakfast, but raw or roasted the dog absolutely refused to touch it. It took us  $3\frac{1}{2}$  hours to get breakfast, collect, saddle, and pack the horses, and take a photograph of the camp, and at 8 o'clock sharp we were on the track again.

The branch of the Wellington River whose source we inves-

tigated rises to the north of the mountain, runs west to unite with the other branch coming still further from the north, then the united stream flows westward, till beneath the Crinoline Hill it turns south to join the Macallister at an acute angle. Hence our course up the Wellington took pretty much the shape of an L—a northward line to the Crinoline, and then a line nearly due east to Mount Wellington.

Two miles jogging along the flats brought us to the last ford of the Macallister, and two more to the first on the Wellington. We had fine views of the Crinoline Hill, so called from its shape and well-marked terraces. At first it lay in front of us up the valley, and then on our left hand as we turned eastward at its base. We crossed the Wellington by an old camp of Mr. Howitt's, and stopped some time to look for a flat piece of iron he had planted there, to serve as an oven for our cakes, but it had vanished. While we were looking for it one of the horses got half-way back over the ford, intent on a return to Heyfield, but was speedily arrested. We saw more butterfly life in these wattled flats of the Macallister and lower Wellington than in any other part of the district. The blue *Ialmenus evagorus* was in great profusion, the chrysalids as usual attended by small black ants. The Hill Butterfly, two sorts of Brown, and the Painted Lady were flying freely, and ever and anon a Skipper darted out in front of us. The pendent nests of the Solitary Wasps (*Polistes*) were noticed several times, attached to the shrubs. The Wellington River has less extensive flats than the Macallister, and our mode of progression up the valley consisted in crossing a spur, longer or shorter, lower or higher, on one side of the river, fording, crossing a spur on the other side, fording, skirting the river, fording, and so on unto nearly forty fords.

After passing the Crinoline Hill, and making some 15 miles from Herald's Flat, we camped for lunch at 12.30 on the Wellington River below Breakfast Creek, and near the turn-off of Whitelaw's track. The river here is very beautiful, a wide and winding rock-bedded stream flowing between high hills thickly clothed with gum trees. Standing or seated on the smooth worn rocks we had abundant opportunity for observing how powerful a denuding and transporting agent lay before us. Beaches of large boulders, smoothed and rounded; pot-holes worked out as by the turner's lathe; huge rocks, isolated, at present defiant but obviously doomed to give way; and here and there a tree torn up by the roots. It must be a glorious sight to see that river in flood time, though we imagine it would be no easy matter to reach it at such a season. We boiled the (chief) billy on a pebbly shore to avoid all chance of kindling a bush fire, and after lunch had a most refreshing bath in the river, which was rather too shallow and broken here for a good swim. The effect of the

cold bath was simply magical. Even he who had just managed to roll off his horse "deadly stiff," felt himself again, and suffered no more the rest of the trip. A photograph was taken of the river, looking up stream. Here we saw *Physignathus howittii*, the Gippsland Crocodile of the press, really a lizard two or three feet long, of semi-aquatic habits, for the first time. Prof. M'Coy considers it to be a variety only of a Queensland species, *P. lesueuri*. It has been met with in Gippsland on all the rivers of the north and east, and was first described by Prof. M'Coy from specimens obtained for him by Mr. Howitt. Dr. Dendy shot three specimens altogether. In making a rough dissection of one Mr. Lucas found the stomach to be full of the heads, skins, and stings of a kind of bee, of which *Physignathus* had made a very clean collection. The reptiles seemed to be aimlessly basking on the rocks, but they were evidently not so idle as they looked.

Out of consideration to those members of the party who were not used to so much riding our leader decided to camp early for the night at a spot about four miles further on, on a well-grassed slope at the foot of what is known as the Gap or Saddle. As we had some hours to spare, Mr. Howitt and Mr. Lucas went botanizing, and the sportsman prowled about for birds. A rocky gorge, dim and deep in its recesses, showed us whence the river came, and where we could not hope to go with horses. On the rugged rocks at the entrance to the gorge we found the bright blue flowers of the Lobelia, *Isotoma axillaris*, and a number of everlasting, while nearer the river were numbers of flowering shrubs, as *Prostanthera rotundifolia*, *Daviesia buxifolia*, &c. With an idea of fishing in the evening we gathered some of the young grasshoppers which abounded. They all seemed to be common low-land species, such as *Ædipoda musica*, *Tropidonotus cinnamonicus*, of the ground forms, and the green *Phaneroptera valida* amongst the bushes. But though the pool was deep we were too tired to fish, and both fish and grasshoppers escaped. Few birds were seen except Musk Crows, and even of these no specimen was secured, another bird (*Strepera anaphonensis*) being shot in mistake for one of them. On our return to camp our leader initiated us into the art of making scones, and got photographed in the process. Alfred was appropriately told off to mind the cakes, while Mr. Howitt told us the legend of Bellin Bellin, the Musk Crow. At night we tried to get some Mountain Opossums, as the dog was barking up a tree, but we found that he was equally ready to bark up any other tree we chose to stop at, so "Jack" was voted a duffer, and again anathematized by our sportsman. Then we listened to incidents of the Burke and Wills rescue, and retired to rest with the pleasant voice of the river still murmuring in our ears.

26TH DECEMBER.—We were up again at 4.30, for one needs must rise early to make good stages in the bush. We had,

however, to-day but a short march before us, and took things easily, so that we had time to skin the bird and photograph the camp and river before we started. Our track lay up the hill-side and over the "Gap," then down again to the river. From the top of the Gap we had our best complete view of Mount Wellington, straight in front of us, with its two characteristic humps on the long summit. We descended to the river, passing close to a ruined hut in which Mr. Angus Shaw once lived. We came on to the river again close to a deep pool, flanked by an enormous vertical rock of black Devonian shale, which we stopped to photograph.

We found the photograph-taking rather a labour, as it involved unpacking one of the pack-horses to get out the apparatus, and thus caused half an hour's delay each time. Crayfishes were seen moving slowly at the bottom of the pool. We continued our journey up stream till we had made about 10 miles from our last camp, and found ourselves on a grassy flat near the junction of two branches of the upper Wellington, and almost at the foot of the mountain. Here we resolved to spend the afternoon collecting, and pitched camp at about 12.30. After lunch we went out to look for specimens, keeping to the banks of the river, which is here narrow, but beautifully clear, with a rocky or pebbly bottom, and with clusters of Lomaria now and again on the banks. We devoted ourselves principally to log-turning, and were rewarded by finding a new handsome black and yellow frog, six species of Planarian Worms (one new and others very rare), a number of earth-worms, and some curiously arranged eggs of insects. With the exception of a planarian, a few centipedes, *Scutigera*, and other millipedes obtained at another camp, the above comprised all the cryptozoic animals we met with. The frog will be described elsewhere, by Mr. Lucas, as *Limnodynastes nigro-lutea*, and the new planarian by Dr. Dendy, as *Geoplana howitti*, after our leader. Meanwhile, diagnoses and notes on the new or rare species obtained are added in an appendix to this paper. Dr. Dendy shot three birds this afternoon—viz., the New South Wales Green Oriole (*Mimeta viridis*), a Shining Flycatcher (*Myiagrua plumbea*), and a Ground Thrush. Gang Gang Cockatoos and Wattle Birds were abundant near the camp, but the former kept well out of the way of the gun. Mr. Lucas caught a fine crayfish in the river, by means of a long forked rod. He considers it to be closely allied to the Yarra crayfish described by Professor McCoy as a variety of *Astacopsis serratus*, and to be best regarded as another variety of that species, and designated similarly, var. *wellingtonensis*. Details of the differences will be published.

About this camp the river flows from side to side of a broad, flat-bottomed valley, bordered by moderately steep grassy slopes.

The level land is thickly timbered with *Eucalyptus amygdalina*, *E. viminalis* (mountain variety), and is probably flooded at times. No plants of very special interest were noted, a very slender variety of *Veronica gracilis* being the prettiest and most abundant. The slopes were gay with the purple flowers of *Vittadinia australis*. In the evening we changed the papers in the press, skinned our birds, and experienced the full horrors of the changing-bag, called even by its author the "torture chamber."

27TH DECEMBER.—We were up about 4 o'clock—indeed, our leader was up a good deal earlier. Our horses were getting used to the hobbles, and the two big riding horses showed that they meant to lead the others into mischief. Mr. Howitt was up between 1 and 2 o'clock and brought them back to camp; and yet when he rose at 3 they were nowhere to be seen. He and Alfred accordingly set out in quest, while the others got breakfast ready, &c. The five were found at no very great distance, but the two ringleaders had left the home track, and made up a spur several miles. Fortunately Mr. Howitt had all knowledge of horses and their ways in the mountains at his fingers' ends, and presently he heard the faint, far-off tinkle of the bells, and the runaways were ridden back without much mercy. This was our last camp before reaching the lake, distant about eight miles, and the worst part of our journey lay before us. In view of this we packed up all the luggage and provisions which we were not likely to want, and made a *caché* of it on the top of a tall stump, out of the way of the dingoes, so as to lighten the loads of the packers as much as we could. Our camp was on the left bank of the river, and, after crossing it once more, and for the last time on our upward march, we made for a great spur of Mount Wellington, up which we struck. The spur was very steep in places, terribly long, and tolerably thickly timbered, and we had to proceed gently and rest the horses frequently.

The under scrub consisted of *Cassinia aculeata* and *Daviesia buxifolia* chiefly, and we noticed a few herbaceous plants, such as *Drymophila cyanocarpa*, the orchids *Dipodium* and *Gastrodia*, *Lobelias*, *Pimeleas*, &c. At last we reached the top, and were indeed rewarded for our climb. Turning a little to the right we found ourselves standing on the brim of a gigantic basin. Immediately opposite to us on the east side rose the main mass of Mount Wellington, towering in lonely grandeur above the surrounding hills, while far below in the hollow of the basin lay the little lake, known to the aborigines as Tali Kango Nigo-thoruka (the little lake on Wellington or Nigothoruk). It looked very small from where we stood, surrounded on all sides but one by precipitous and thickly wooded slopes. It really occupies an area of about 22 acres, but one end of it lay to our right, and was hidden by the trees on the mountain side below us. At this end

should be the outlet, but it is blocked by a great barrier of rocks, of which we now had a good view, though the actual rocks are concealed beneath an abundance of vegetation. At the other end we could see the gully of a small creek (Nigothoruk) which enters the lake, flowing down from the high plains above. Our photographers unpacked and secured the views, while Mr. Lucas made his way round under the precipice. It was beautifully decorated with clumps of the blue *Veronica perfoliata*, while on the less steep slopes below its white-flowered congener, *V. derwentia*, flourished in company with *Senecio lautus*. A number of small orchids, *Caladenia carneae* and *Pterostylis curta*, reminded us of the spring we had had so much earlier near Melbourne.

It looked an awkward job which lay before us, for we had to take seven horses down to that lake, through rocks and scrub into which even the wild cattle never venture. However, we scrambled down somehow or other, leading the horses, and making a track as best we could as we went along. A good bush fire is wanted here to clear things up a little. Fortunately, we reached the bottom without any serious mishap, though one of the packers fell and rolled over a bit. On the way down, as he was leading a horse with one hand, Dr. Dendy captured with the other a lizard, rare in this colony (*Amphibolurus angulifer*). Curiously enough, Dr. Dendy had obtained the same lizard before at Walhalla. It is a pretty little creature, allied to the Common Bloodsucker, of a general drab-brown colour, with a line of bright brown diamond-shaped patches down the middle of the back.

Arrived at length at the bottom, we had next to push our way through the scrub and boulders along the edge of the lake till we came to a patch of level ground where we could hobble the horses. This patch, the delta of one branch of a now dry creek, was covered, fortunately, with young and green wild raspberry shoots, which the horses ate voraciously. Then we had a swim in the lake, and found the water to be cold, clear, and deep. We pitched our camp a little further on, close to the lake, below a great fallen log in the other branch of the gully. Before this, however, Mr. Howitt had to despatch a large Copperhead Snake which occupied the ground we had set our minds on. The thick scrub comes down on the mountain sides nearly to the water's edge, leaving a narrow shelving, rocky beach, which is probably covered with water when the snows on the mountain melt.

The gully behind us was alive with birds, which we heard calling in every direction. There were Bower Birds and Lyre Birds, Gang Gang Cockatoos and Coachwhip Birds, and Pennant's Lorikeets, and on the lake we saw several Divers. We had little time for shooting, however, and the only victim was a Lorikeet, which we never had time to skin. Along the shores of the lake, and in the weeds at the edge were plenty of frogs (*Hyla lesueurii*), and

in the water we could see thousands of tiny trout. Close to our camp there was more greenery than elsewhere. Shrubs of Orites and Lomatia, Coprosma, and a few Blackwood trees, shaded us from too much sun, while our carpet consisted partly of a beautiful patch of the fern *Polypodium punctatum*, and partly of grass, studded with myriad blooms of the violets *V. hederacea* and *V. betonicifolia*.

After lunch we divided our forces. Mr. Lucas went fishing, Alfred stayed to fix up the camp, Mr. Howitt and Dr. Dendy went to look for the outlet of the lake. Mr. Lucas had brought up the smallest hooks and flies procurable in town, and made for a small rocky promontory by which the water was deep. The first throw of the fly caused a commotion—all the fish about wanted to bite. One rather bigger than the rest got on, and it seemed as if it would be easy to secure as many specimens as we wanted. But it soon became plain that the hooks were too large. Alfred caught two more, using worms and grubs as bait, but when the explorers came back they found the fishermen patient but scarcely hopeful. Dr. Dendy accordingly wished to try his hand, and succeeded in getting two more before tea-time by means of one of the fly-hooks stripped of the feathers and baited with a minute bit of cork stuck on the extreme point of the hook. Afterwards small pellets of dough were used, but it was obvious that the nature of the bait was of no consequence. Whatever it was, the fish went for it eagerly; as soon as it touched the water round came a shoal, but it was very difficult to hook them. Mr. Lucas made an ingenious net out of his blue fly-net, but in spite of all our efforts we only caught half-a-dozen altogether. The species proves to be a new one, and will be described by Mr. Lucas as *Galaxias nigothoruk*. The average length is about  $2\frac{1}{2}$  inches, and the colour a dark olive green with multitudes of deep brown spots.

Mr. Howitt and Dr. Dendy made their way along the shore of the lake, and so came to the great barrier which dams the head of the valley. From the general lie of the country it was obvious that the lake must be connected with the Wellington River—indeed, that one branch of the latter takes its origin in the lake—and our explorers were now going to examine the valley below the barrier. They forced a passage through the thick scrub, which covers it and shows that the lake never bodily overflows. They crossed the barrier on the right, and found themselves at the head of a great gorge which they named the Valley of Destruction. The bed of this gorge is a jumbled mass of huge angular rocks, many as large as houses, piled on top of one another in inextricable confusion, while in the crevices between the rocks, and wherever a scrap of soil is available, a dense scrub grows, consisting in part of good-sized gum trees, while dead limbs and trunks have in many places fallen across the rocks and added their share to the general confusion.

To force their way through this was no easy matter, and progress was slow, as they had to go carefully with their photographic cameras over the rocks. Presently they saw through the trees on the left hand a great vertical cliff, a wall of naked rock, 400 or 500 feet high, towering above them in the distance. This cliff is part of Mount Wellington proper and forms the south-east side of the gorge. They stopped to take a photograph of this, which we propose to call Dendy's Heights, and then made their way until close under the foot of the precipice, when they photographed it again as best they could, for it was a difficult matter to get anything like an uninterrupted view through the thick scrub, and the camera had to be considerably inclined in order to take in the top. They now found that it was getting late, and that it was advisable to return to camp, so that, although they had fancied for some time that they could distinguish the sound of running water away below, they gave up the search for the afternoon. In returning they kept to the left or south-east side of the valley, and found the ascent here very much easier than on the other side or in the middle. They came back to the lake over the barrier again, close to the Mount Wellington side of the latter, and past a great twin gum tree near the water's edge, which forms a convenient indication of the best place to cross the barrier.

28TH DECEMBER (SUNDAY).—We were up early as usual, and after breakfast looked after the horses, which were taken to a gently sloping bank a little up the hillside, on which grew a little grass and plenty of bushes of the everlasting, *Helichrysum semipapposum*, of which the animals appeared to be fond. Large numbers of the pretty purple daisy, *Brachycome scapiformis*, grew amongst the grass, and climbing amongst the bushes a pink or purplish-tinged variety of *Clematis aristata* was remarked. This was our day of misfortunes, and these soon began to show themselves. It was found that Alfred's skewbald had staked himself or else been cut by the rocks. Anyhow a gaping wound appeared on his flank, some eight inches long and three broad at the widest. Still he didn't seem to mind it, and we hoped for the best, and as a matter of fact he never became at all lame, and got home quite happily. Then, leaving Alfred in charge of the camp, we all started at about 6 o'clock to make a determined effort to find the place of issue of the water. Profiting by the experience of yesterday, we went down easily enough as far as Dendy's Heights, and then, after a long and steep descent, matters became more exciting, for the rocky bed of the gorge became deeply channelled into dry gullies, which showed clear indications of the presence of running water at some time or other in the numerous rounded boulders and pebbles. We rapidly scrambled down what appeared to be the principal gully, but it was, even yet, an exhausting business, for we were in a great hurry to get to the

springs, which we felt certain must now be near us. Presently we distinctly heard the water, and at length the vegetation became visibly greener and more luxuriant, till suddenly we saw in front of us a small still pool among the rocks, as clear as crystal, and fringed with a rich growth of ferns. Into this pool a tiny streamlet trickled from between the rocks. The mystery was solved, and in just the way we expected, for it was evident that the water from the lake filtered through the barrier at the head of the gorge, and worked in underground channels between the rocks which partly fill the gorge, to come out here at length 550 feet below the level of the lake, at a point perhaps a mile and a half distant. We stopped awhile to rest and photograph, and soon found that this was not the only spring. Within ten yards of the pool was a beautiful little rocky-bedded stream, shaded with tree ferns and the musk and other Asters, *Prostanthera lasiantha*, &c., and we found that this came out in a number of springs a little higher up. There are probably at least half a dozen springs distinguishable, and most likely the position of the outlets varies with the quantity of water coming from the lake; so that at the time when there is most water in the lake the springs will rise at the very beginning of the watercourse we noticed in coming down. As the stream at whose source we were standing is only awkwardly styled the Wellington branch of the Wellington River, we baptized it by the name of the Barrier Creek, alluding to its mode of origin.

We now began to retrace our steps. We were anxious to make out the nature of the rocks in the middle and on the other side of the Valley of Destruction. We deliberately therefore chose the more difficult route, and found that a very distinct ridge ran down the middle of the valley, separating ravines on either side. The highest rocks lay along and helped to form this ridge. Pile after pile of great jumbled rocks succeeded one another in apparently endless confusion—huge blocks, like houses or haystacks, with yawning abysses between them, and horrible caverns under them, and dead trees fallen across them, and living scrub growing thickly in the crevices: and over all this wilderness we had to make our way. We climbed upwards, and upwards, scrambling between the rocks or over them, and in one case beneath them, only to find fresh barricades ahead of us. Now we turned to the right and then to the left as precipice after precipice baffled us. The rocks were found to be irruptive quartz porphyries, which Mr. Howitt considers to occur interbedded with the Devonian strata. They sometimes assumed strangely fantastic forms. One group was especially remarkable. One gigantic rock towered into the air, and bore another of about half the size perched upon its summit, while alongside were two other massive fellows each as big as the other two put together. It took us an hour and a half

to photograph this pile of rocks. It seems a long time, but it must be remembered that there was not an inch of level ground on which to set up the cameras, and we had to climb up on the top of several big rocks, where there was only just standing room for us and our apparatus, before we could find a suitable view. Finally we hit upon a good place, and while one photographed the others held the legs of the camera. Still proceeding, leaping or climbing according to our disposition, we came upon what we thought really must be part of a cliff *in situ*, so enormous was the single mass of rock. We had much difficulty in getting round this rock, and then, satisfied with the central ridge, made our way, partly by aid of a tree bridge over a chasm, slowly and wearily to the Wellington side of the valley. As we passed along the lake side Mr. Lucas noticed a very delicate little characeous plant growing in the water, which the Baron von Mueller is forwarding to Europe to the specialist, Professor Nordstedt. We reached our camp about midday, just as it was coming on to rain. A swim helped us to pull ourselves together again.

As to the manner in which the lake and the Valley of Destruction have been formed there is more than one opinion amongst us.

Mr. Howitt still considers that the most probable explanation as to Lake Nigothoruk is the action of a glacier which extended from the Mt. Wellington Plains down the valley. When he first visited the lake, and studied the structure of the whole country as seen from the shoulder of Mt. Wellington, both causes now assigned suggested themselves to him—namely, landslips and ice action. The Devonian formation at the lower end of the lake consists, so far as Mr. Howitt is aware, almost, if not altogether, of igneous rocks, being great thicknesses of quartz porphyry (possibly also of porphyrites), flanked to the east and west by sedimentary strata. After several visits to Lake Nigothoruk, and such examinations as limited time permitted, he is unable to conceive how in such formations there could occur landslips of the magnitude and of the kind necessary to support that hypothesis. The dam which blocks the valley extends from side to side at a place where the width is about ten chains. A spur on either side contracts the previous width of the basin-like expanse in which is the lake. The dam rises to some 100 feet above the present water level, and extends for over a mile down the valley, until at its termination it is some 500 or 550 feet below the lake. The centre of this great mass of angular rocks is higher than the sides, which at the range on either hand form a depression. It is at the termination of this gradually lowering mass of rocks filling the valley that the waters find their exit, as the source of one branch of the Wellington River. Mr. Howitt has been unable to observe any signs of landslips in the igneous rocks there. The form of the

dam, its structure, as well as the general character of Lake Nigothoruk strongly suggest to him a moraine blocking up the valley. To positively determine the real nature and origin of the lake will require a detailed geological examination of the locality, which at present it has not been possible to make.

Dr. Dendy explains matters as follows :—The upper part of the Barrier (and Nigothoruk) Creek originally flowed in a continuous stream down from the high plains through the valley or basin where the lake now is, but where there was then none, and then through a deep and at first narrow gorge bounded by two high cliffs, one on the Mount Wellington side and one on the other side, then onwards along its present course. The cliffs on either side of the narrow gorge weathered year by year ; the frosts and heavy rains detached great fragments, which rolled down into the gorge and blocked it up. In this way the barrier was formed and the valley below partially filled with great rocks. The cliff on the side of the gorge away from Mount Wellington weathered away completely, the process being very probably aided by great landslips from time to time; on the Wellington side a great part of the cliff still remains. In this way the waters of the river were dammed back by a great barrier of rocks, and formed the lake, and the stream was divided into two parts—the Nigothoruk Creek, flowing down into the lake, and the Barrier Creek, which flows out through the Valley of Destruction. Apparently these two parts are now disconnected, but only apparently, for the water flows through the rocky barrier, and comes out again below it.

To Mr. Lucas's mind there are difficulties in both these explanations. The phenomenon is unique, and required a very precise and peculiar combination of conditions and forces to produce it. If it be a glacier lake there surely should be others in the district, and especially among the higher mountain ranges to the north-east. No such lakes exist. The moraine, if a glacier moraine, is most remarkable. The loose rocks are now angular, which implies comparatively recent weathering ; they all seem to be of the same nature as one another and as the bed rock of Dendy's Heights and the rocks thought to be *in situ* in the central ridge. The group of rocks particularly described above showed plainly the way in which the rocks are still weathering. The landslip theory seems at first to explain matters ; but, again, there are many narrow gorges and steep opposing cliffs, yet no other landslip lake is known in Gippsland. The top of the Barrier is as flat as that of a breakwater, and it is not easy to see how it could be levelled so uniformly if it were a landslip. The water, too, would find its way round a landslip, and soon construct a new channel, especially if the *debris* were accumulated gradually. He rather inclines to the view, then, that the water leaves the lake as it at first left the river bed, by fissures along the joints of the eruptive

rocks, and working its way along some of these underground channels, and choking up others with detritus, the supply and discharges of the lake are tolerably well balanced. Let a drainage system lower than the lip of the upper valley be once established and the river would cease to flow over the edge of the upper valley.

After lunch we packed up, and saddled the horses, and about 3 p.m. were ready to depart. Coming down to the lake had been bad enough, but going up proved to be a good deal worse. We had to lead the horses, of course, and had not gone much more than a hundred yards when Dr. Dendy's horse got its off hind leg into a hole at the foot of a ledge, which was concealed by a few loose stones lying over it. In spite of all efforts to hold him up by the head, he rolled over on to a lower ledge and lay on his back, still caught by the one leg, with the others in the air kicking wildly. He must have lain in this fix for nearly 20 minutes, the bone of his leg bent and expected to snap at any moment. We called back our leader and Alfred, tied up all the other horses, and bent all our energies on extricating the poor brute if possible. The first thing was to slip a halter round his free hind leg, and to hold it forward while we removed the loose stones and widened the hole as much as we could. Dr. Dendy got the tomahawk and cut down a sapling, out of which we made a lever, which we pushed under the animal's shoulder. Then Alfred tugging at his head with the halter, and two of the others pulling with all their might on the long arm of the lever, we succeeded in lifting him up on his three legs, when, to our delight and relief (for one of us had got out a cartridge expecting to have to put him out of his misery), he lifted the other foot out of the hole and stood upright on the ledge. As we knew must be the case, however, he was badly lamed. We had lost a good deal of time, but we started again, picking our way as carefully as we could, driving or coaxing the lame horse. Presently, as we were making a narrow sidling track along a steep place where only one horse could go at a time, poor old Brownie stumbled with his hind legs on some loose stones, and tumbled down the rocky slope below, rolling over and over until brought up some 30 feet below between a big fallen log and the hillside, where he lay sprawling, with his legs in the air. Fortunately he was carrying the bedding, and so was not hurt. It was certainly a comical sight, and made even the horseman who had to follow on the same track laugh; but we were late already, and wanted to get to a safe camp before dark, and this mishap was thus serious enough. There was nothing for it but to climb down after the brute, unpack him, lead him up again to the pass, and bring up the pack bit by bit. Brownie as nearly as possible went down again on this second passage, but was held on the track by main force. There was a tin billy strapped on the back of the

pack, and when we rescued it it was a most ridiculous object. It would puzzle a mathematician to say what shape it was. We packed up and started again, and without further misadventure reached the edge of the basin, and saw that a thick fog was rolling down Mount Wellington and filling up the valley. Then we discovered that the gun and fishing-rod had been left where the pack-horse had rolled down. This was rather disgusting, but as Mr. Howitt was the only one who could be trusted to find his way he volunteered to go back for the things, and rode off on the big bay. The rest of us waited, looking over the edge of the basin, and speculating on the probabilities of our leader never turning up again, till at length we were rejoiced to hear the clatter of his horse's hoofs on the rocks below, and Mr. Howitt emerged safe and sound from the fog, which now crept all around us. Off again, first taking care to find a tree, which we had marked with a cross on our way up, at the turn off to the track down the big spur. Dr. Dendy was presently observing to Mr. Lucas that Mr. Howitt was the only one who had had no misfortune, when our leader announced that he had lost the track in the fog. While we were smiling grimly at this last streak of ill luck a violent thunder-storm burst over us, and the rain came down in bucketfuls. We hastily donned our ponchos and aprons, and were glad to make use of the storm to collect some of the rain-water in a piece of waterproof. It relieved our thirst, and that is all we can say for it. Our leader did his best to recover the track, but the mist, rain, and approaching darkness were too much for him, and we had to abandon the hope of reaching our old camp. We could not camp on the top of the range, so we made down the hill-side into the nearest gully, and following this down soon came to a succession of small waterholes. It was now quite dark, so we tied up the horses to trees, and made our camp on a steep slope above the waterholes. Our first care was to make a fire, and this was done by tearing off the inner bark of the Stringybark, which was perfectly dry and made excellent kindling. The side of the hill was so steep that it was difficult to find a place where a fire would lie, but we managed it by dragging a big log across and piling up the sticks and smaller logs against it. When we wanted a flare-up to let us see what we were doing we threw a few twigs of *Daviesia buxifolia*, of which there were many bushes around us, into the fire. The essential oil burnt up at once, giving a brilliant white light. Then we had to drive pegs into the ground to put our feet against to prevent us from slipping down into the fire, with another above us to tie the blankets and waterproof to. We had a miserable tea, and the baking powder being exhausted we had to content ourselves with unleavened bread. Still we did not feel particularly unhappy, for we felt the day had not been devoid of interest, and we enjoyed

the novelty of the situation ; and, after all, things might have been worse. It had stopped raining, and we were too tired to rig up the tents, so we rolled ourselves up in our blankets and water-proof, after drying our clothes at the fire, and were prepared to spend the night thus. About midnight, however, the thunder-storm returned, with much rain, and we got up in a hurry and hastily rigged one of the tents, into which we all squeezed, and lay in a row, more or less unconsciously waiting for daylight.

29TH DECEMBER.—When daylight came it was still raining hard. We turned out at 3 o'clock, stiff and more or less miserable, and packed up as quick as we could. We did not stop for breakfast—indeed, there was none to stop for—but contented ourselves with a pannikin of water-cocoa apiece, and set ourselves in marching order. The lame horse was now stiffer than ever, with his leg fearfully swollen ; but we found he could go along fairly but very slowly when his leg warmed up, though at first he seemed to progress only on "three legs and a swinger." We made our way up the hill through the wet bushes, hoping to strike our old track, but were too far to the east. Our leader, however, knew the lie of the country, and we made a new track, striking the Barrier Creek two or three miles above our camp, and reached the latter at 8.30, uncommonly glad to get there. The rain had soaked everything, and we had the greatest difficulty in lighting a fire. There was no stringybark near, and we spent a good hour or more before we succeeded in establishing a fire. We made a good breakfast off rashers of bacon, toasted on forked wattle sticks, had a swim, and felt all right again. We were now bush seasoned, and nothing came amiss or seemed to seriously inconvenience us. Before we could leave Mr. Howitt had to shoe Alfred's horse, and it was 2 o'clock before we were once more on our way, Dr. Dendy leading the lame horse. Our progress was necessarily slow, but we had all the better opportunity for looking around us. There was always a fresh excitement when we had to get the lame horse and the pedestrian over a ford. At first we rode him, which was rather a risky proceeding, and nearly resulted several times in the ducking of the rider. Then we gave that up, and led him over, the Doctor staying behind till another horse was led back for him. This caused much delay in mounting and remounting. The fords were so numerous that on our way up we had altogether lost count of them, so we cut a long wattle stick and made a notch in it for every ford we crossed. We thus found that in going down we crossed the Wellington River 35 times (in about 20 miles) and the Macallister five times. The fordings were much alike. One had to first brace up the mind of one's horse to go down a rather steep bank into the water, pulling down a packer after us ; then the horses felt their way among the boulders, some of

which gave way under their feet ; then, the coast being clear on the other side, the big horse would go up the bank like a house on fire, while the packer remained in the river to drink, so that one's arms were dragged pretty well out of their sockets holding back the one and lugging on the other. We found that some of the fords were characterized by the presence of particular shrubs on the banks—one by *Lomatia longifolia*, another by *Callistemon salignus*, and others respectively by *Dodonea viscosa*, *Prostanthera rotundifolia*, *Leptospermum scoparium*.

We managed to make 17 miles this afternoon and camped for the night near the creek which comes down from the Crinoline Hill. On the bank of the river close to the camp Dr. Dendy shot a very fine specimen of *Physignathus*, but although he made a resolute attempt to skin it by the light of the camp fire there was not time or light enough to finish it, and by the time we reached Melbourne the specimen was ruined. Even the skull was destroyed, for it was shot at close range with a charge of 8's.

30TH DECEMBER.—We rose early as usual and, immediately after having his breakfast, Alfred left us to ride on to Heyfield, where he had another engagement. To our great relief he took the dog with him. Before starting on our day's march we photographed a very fine terraced hill on the river, just below the camp, which looked as if it must be a splendid place for Rock Wallabies. Our day's march was not exciting and we had all we could do to make the lame horse go at all. We pushed on as fast as we could, and managed to save a good deal of time at the fords by double-banking Mr. Lucas's horse. On these occasions we felt the want of a detective camera, for we cannot adequately describe the scene in words—Mr. Lucas and Dr. Dendy crossing the ford, one behind the other on the same horse, carrying a gun and leading a pack-horse by a rope at the same time. They very nearly came to grief several times, but not quite. The only member of the party who thoroughly enjoyed the proceedings was our leader, who stood on the bank and laughed irreverently. About midday we stopped to photograph a fine red rock by one of the fords, and to save time we boiled the billy and made our frugal lunch at the same place. After crossing this ford we killed a fine example of the Black Snake (*Pseudechys porphyriacus*), but the doctor's ford stick was broken in half in the process and henceforth had to be carried in two pieces. Further on we stopped to photograph another terraced hill. Then we pushed on again and presently met Mr. William Riggall, who had heard of our approach from Alfred, and had very kindly ridden up from Glen Falloch to meet us. He accompanied us to the station, and on the way we left the lame horse in a paddock, and were glad to get rid of him. We hoped he would have recovered, but we might as well have shot him at the lake, for latest advices

inform us that he is no better, and will never be any good again. Poor horse ! we cannot help being sorry for him, for all his clumsiness ; and to think of the trouble we had to get him down from the mountains to a safe resting place ! Shortly before we arrived at Glen Falloch Mr. Howitt caught a Freshwater Tortoise (*Chelodina longicollis*), in the middle of the road. The first thing the creature did was to emit a most foul and pungent smell, strongly resembling garlic, but he (or rather she) was secured and carried down to Melbourne in triumph notwithstanding, and may now be seen in the Aquarium at the Exhibition Buildings. At Glen Falloch we enjoyed the luxury of tea with milk and fresh bread and meat. Mr. Riggall was very anxious for us to stay the night, but it was only 5 o'clock, and Mr. Howitt and Mr. Lucas wanted to hurry on another eight miles and camp. Matters were compromised by Dr. Dendy's staying for the night for some duck shooting, the others riding on with the pack-horses and camping at Hickey's Creek. There were plenty of ducks about the station, and also some black swan on the river. There were also plenty of kangaroos in the neighbourhood, but we had no time to go and look for them.

Messrs. Howitt and Lucas rode on at a smart pace, and soon came to the Big Hill. The charm of the evening calm was now felt, and one of them, at least, felt this to be the most enjoyable ride in the trip. From the crest of the hill, the mountains to the east, with the sunlight still on them, were verdant with eucalyptus and acacia foliage, while those to the west were of a deep blue, gradually darkening as the evening advanced. Mr. Howitt told of earlier adventures in mountainous Gippsland, and related legends called up by the objects noted, legends handed down by generations of blackfellows who had lived in this rugged country we were travelling through.

At Hickey's Creek they turned off and forded the Macallister, camping in one of Mr. Riggall's paddocks. As it was very late only the fly was put up, but with a good fire in front it was not cold. A native bear in a tree close by gave us a musical entertainment in the early part of the night.

Messrs. Howitt and Lucas rose at about 3 o'clock, determined to get to Melbourne by the New Year. The Macallister at the place where they camped is a broad stream. Going down to wash and get water, they found that the frog met with at the lake abounded here also. They saw also some spiders running on the water after insects, which seemed to be rather a new line of life for spiders. Mr. Howitt took photographs of the camp and of the river. Then they rode back to Heyfield over old ground, and arrived there about 1 o'clock.

31ST DECEMBER.—Dr. Dendy started from Glen Falloch about 7 o'clock with Mr. Riggall, who was riding down to Glenmaggie,

and kindly lent him a fresh horse. They expected to overtake the rest of the party before reaching Heyfield (34 miles), but Mr. Howitt and Mr. Lucas were up and away too early, and when Dr. Dendy reached Heyfield at 1 o'clock he found them unpacking in front of Sewell's Temperance Hotel.

While we were unpacking, Alfred brought in a fine Nankeen Crane which had just been shot. After a splendid dinner we packed our traps and settled up, the last excitement being the drawing of lots for the remains of the provisions and sundry articles, such as tents and saddle bags, which had been purchased for the expedition. The Tortoise was placed in a tub of water for the afternoon, and surprised us by laying four eggs. Then we drove to the station and caught the evening train to Melbourne.

#### APPENDIX.

##### NOTES ON THE EUCLYALPTS GROWING IN THE MACALLISTER AND WELLINGTON VALLEYS, &C.

Between Heyfield and Glenmaggie the eucalypts vary in kind according to the formation. In the alluvial flats, and up to the edge of the higher sandy and gravelly tracts, are found the Gippsland Red Gum (*E. tereticornis*), the Red Box (*E. polyanthema*), and the Apple-tree (*E. stuartiana*). On somewhat higher ground occur the Yellow Box (*E. melliodora*), with the White Stringybark (*E. piperita*), especially in sandy and gravelly ridges. The Ironbank (*E. leucoxylon*) also is found in places.

About Glenmaggie, and thence by way of Blanket Hill to the Macallister River, the eucalypts vary according to soil and geological formation. Along the creeks and along the immediate course of the river is found the White Gum (*E. viminalis*). In the basaltic areas are found *E. tereticornis* and *E. melliodora*, while in the Silurian formation the Stringybark (*E. macrorhyncha*) and *E. polyanthema* prevail. On some ridges which were passed over before reaching Blanket Hill it was observed that in one place *E. stuartiana* predominated, in another *E. melliodora*, and in a third an isolated colony of *E. leucoxylon*.

It is to be noted that the White Stringybark (*E. piperita*) grows up the Macallister River as far at least as Hickey's Creek. It grows on the drier flats, while *E. macrorhyncha* occupies the hills. On the crest of some ridges of the Big Hill, between Hickey's Creek and Glen Falloch, a peculiar form of *E. goniocalyx* (Spotted Gum) is found. This is the case in other parts of the Gippsland mountains.

It was observed that *E. tereticornis* occurs in the Glen Falloch basin in the soft Devonian shales. This is quite exceptional, this tree being elsewhere limited to the alluvial tracts, and not

occurring in the mountains. It is accompanied by *E. stuartiana*, of great size, and *E. melliodora*. In the hills are, as usual in this valley, *E. macrorhyncha* and *E. polyanthema*.

These eucalypts, together with *E. melliodora* and *E. stuartiana*, form the forests on the Wellington River. It is instructive to observe there a struggle for supremacy between them. In places there are a few scattered large old trees representing the former condition of the forest when the country was first stocked. In such places there are no generations of trees after them until a very numerous growth of young eucalypts not exceeding, say, twenty years. It was observed that in some places the Stringybark (*E. macrorhyncha*) was much more numerous in these young forests than either *E. melliodora* or *E. stuartiana*, although, for instance, the very old trees may be all of the former species. This would indicate that the Stringybark is prevailing.

After ascending the Gap to the country of the Upper Wellington some change was observed in the eucalypts. The common Peppermint Gum became prevalent in places, especially in river flats. The Mountain White Gum appeared for the first time. This is a manna-producing gum, with the general habit, the flowers and fruit of the White Gum (*E. viminalis*), but with seedlings and young saplings more approaching those of *E. stuartiana*.

Still other changes in the forests were observed in ascending the mountains over which it was necessary to pass to proceed to the lake. The lower ridges are clothed with *E. macrorhyncha*, *E. stuartiana*, *E. viminalis*, and *E. melliodora*, but in a somewhat stunted form. *E. amygdalina*, which prevails in the river flats, ascends the gullies and shady side of the ridges. At approximately 700 feet above the river a change is to be noted in the appearance of *E. sieberiana* (the so-called Mountain Ash, or Gum-top), which thence is in places the only or almost the only eucalypt on the ridge and the sunny side of the range, or together with *E. macrorhyncha*, while on the shady side and in the gullies are *E. amygdalina*, *E. viminalis*, and, finally, *E. piperita*. This latter Stringybark reappears here at the sources of the streams, as it does elsewhere in the Gippsland mountains, not crossing to the northern slopes, unless under very exceptional circumstances, into the sources of the streams. *E. melliodora* appears to cease about the altitude at which *E. sieberiana* commences to grow. On the summit of the range above Lake Nigothoruk we observed *E. viminalis* (a mountain form), *E. amygdalina*, and *E. piperita*, all being of large size. *E. obliqua*, the Messmate of Gippsland, was also observed here for the first time during the trip. At the lake and in the valley leading down from it the eucalypts observed were *E. sieberiana*, on the sunny flanks of Mt. Wellington, with *E. macrorhyncha*, *E. viminalis* (of large size), *E. amygdalina*, *E.*

*piperita*, *E. obliqua*, and the lowland form of the Spotted Gum, *E. goniocalyx*. These eucalypts form a group of lowland forms which are seen elsewhere to ascend into the cool and moist valleys on the southern sides of the mountains of Gippsland. *E. sieberiana* ascends to the source of one branch of Nigothoruk Creek, where, in the saddle which connects Mt. Wellington proper with the plains to the north of it, it forms a dense sapling scrub at an elevation of about 4,500 feet above sea level.

A. W. HOWITT.

### ABORIGINAL LEGENDS.

#### THE LEGEND OF THE MUSK CROW AND THE EAGLE HAWK.

Bunjil, the Eagle Hawk, determined to leave the earth, and to go up with his people to the sky. He said to Bellin Bellin, the Musk Crow, "Go and get some wind." So Bellin Bellin got a bag of kangaroo skin, and filled it with whirlwinds. Then Bunjil, holding on to his great spear, which he had thrust into the ground, said "Let some out." Bellin Bellin did so, and the whirlwind tore trees out of the ground, but could not move Bunjil, who said "Let out some more." Accordingly Bellin Bellin opened his bag and let out all the whirlwinds at once, and Bunjil and all his people were carried up into the sky, where they have remained ever since.

#### THE LEGEND OF THE ECHIDNA AND THE THUNDER.

Thadagun, a wrinkled sorceress, long ago stole a child and hid it in the fastnesses of the mountains in a great rock. Bunjil, the Eagle Hawk (compare "Bird of Jove"), knowing of this wickedness, called his people together, and ordered Krauun, the Spiny Anteater (Echidna), to smash the rock with its thunder. Krauun did this, and the thunder having smashed the rock, and at the same time killed Thadagun, Bunjil restored the child to its parents, and told the people to observe what happened to evil-doers.

This tale was current in the Yarra tribe. In Gippsland it was said that Krauun, the Echidna, had married the daughter of Gworun, the Thunder. Gworun was thought to be a female. According to aboriginal custom a man cannot look at, speak to, or indeed have any communication with his wife's mother. Hence it is, say the aborigines, that the Echidna burrows in the ground when it hears the thunder.

#### THE STORY OF HOW THE BOUKAN STOLE THE FIRE OF THE KUMAI TRIBE.

Boukan was believed by the Gippsland Kumai to be a supernatural being of whom several stories are told. Boukan had a son called Bulumtut. It is said that long ago Boukan had a

grudge against the Kumai ancestors, some of whom (women) had refused her some fish which they were cooking. In revenge she and Bulumutut stole their fire while they were absent, and proceeded to ascend to the sky from what is now called Wilson's Promontory. Bulumutut threw up a cord of emu sinews to the sky where it stuck fast. He pulled at it, and it broke. He did the same with another cord of the sinews of the kangaroo, which also broke. Finally he threw up one made of the sinews of the Red Wallaby (Ginara), and this held fast. Finding it safe, he said to Boukan, "You hold on round my neck, and carry the fire." Then he began to climb up the cord.

Meanwhile Bellin Bellin, the Musk Crow, who was a friend of the Kumai, had seen all this, and he went to Bunjil, the Eagle Hawk, and told him. The Hawk flew after them, and swooping on them, beat them with his wings so that Boukan let fall the fire-stick. The Robin, seeing it fall, blew it up into a blaze, and smeared some of the fire over his breast, and made it red, as it is still. Bulumutut climbed up to the sky with Boukan, whence they have never returned.

This is how the Kumai nearly lost their fire.

A. W. HOWITT.

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NOTES ON THE PLANARIAN WORMS OBTAINED ON THE UPPER WELLINGTON.

1. *Geoplana howitti*, species nova.—Unfortunately only a single specimen of this worm was found, but it is a well marked and very beautiful species. The ground colour of the dorsal surface is yellowish white. In the middle line there is a fairly broad band of the ground colour, and on each side of this a stripe of about equal width of dark purplish brown, then a rather broader band of ground colour thickly flecked with dark purplish brown and edged on the outside by a fine line of the same. Outside this is a very narrow margin of ground colour. All the dark bands unite at each end. The ventral surface is pale yellowish white or grey, with no markings.

2. *Geoplana lucasi*, Dendy.—This is a remarkable and very rare planarian, of unusually large size, and with black and white markings. It was hitherto known only from three specimens found on the top of the coast ranges in the Croajingolong district, on the occasion of the Club's expedition to that locality, and described (from spirit specimens only) by me in the "Transactions of the Royal Society of Victoria." Only a single specimen was found.

3. *Geoplana quadrangulata*, Dendy.—A small variety of this remarkable species was found in abundance. Hitherto it has only been recorded from Macedon, and in very small numbers.

4. *Geoplana frosti*, Spencer.—This species was recently discovered on the Club's expedition to the Yarra Falls, and is described by Professor Spencer in the "Transactions of the Royal Society of Victoria." We obtained one small specimen.

5. *Geoplana alba*, Dendy.—We obtained several fine examples of this common planarian.

6. *Geoplana sulphurea*, Fletcher and Hamilton.—This species was common.

ARTHUR DENDY.

---

#### AN APPEAL.

(*To the Editor of the Victorian Naturalist.*)

DEAR SIR,—You may be aware that for some years past I have been investigating the Land Planarians of Victoria, and have already described in the "Transactions of the Royal Society of Victoria" a considerable number of species. Since the publication of my last memoir on the subject I have, with the assistance of numerous friends, largely added to my collection, which now numbers twenty-one Victorian species, represented by two or three hundred specimens. I am at present engaged in the preparation of a further memoir on the subject, which will deal with several new forms hitherto undescribed, and also give additional particulars as to the variation and distribution of the already described forms. In order to make the work as complete as possible, I am anxious to obtain specimens from all parts of the colony, and venture to appeal to members of the Club for assistance. Most of our members are doubtless aware that the Planarians are small, leech-like worms, found under logs and stones. They can easily be transmitted alive, as they live for a long time in a closed box filled with damp moss, and a good many can be put in a very small box. They may also be preserved in methylated spirits, but in this case very careful notes of the colours and markings on both surfaces of the living animal should be taken, as the spirit soon bleaches the specimens, so that identification becomes very difficult.

Any specimens which members may be able to send me will be gratefully acknowledged. I may add that I shall also be very glad to receive specimens from other colonies besides Victoria. Specimens should be addressed,

DR. ARTHUR DENDY,

The University, Melbourne.

## DESCRIPTIONS OF NEW AUSTRALIAN PLANTS, WITH OCCASIONAL OTHER ANNOTATIONS;

BY BARON VON MUELLER, K.C.M.G., M. & PH.D., F.R.S.

(Continued.)

EUGENIA FITZGERALDI. F. v. M. and Bailey.

Leaves on short petioles, firmly chartaceous, mostly ovate-lanceolar and bluntly acuminate, much paler green beneath, their oil-dots extremely minute and much concealed; cyme comparative short, the peduncles very slender; flowers rather large, glabrous; inner lobes of the calyx more than half as long as the petals, all finally deciduous; stamens conspicuously exserted, their anthers narrow-ellipsoid; stigma minute; fruit relatively large, globular, its pericarp rather thin, bright-red outside; seed large, solitary, its cotyledons equal, hemispheric.

On the Richmond-River.

Leaves generally 3-4 inches long, sometimes slightly undular at the margin, the primary venules rather distant, the oil-dots almost invisible. Cyme in most cases hardly extending beyond the two nearest leaves. Pedicels quite short. Inner calyx-lobes largely membranous. Petals whitish,  $\frac{1}{4}$ - $\frac{1}{3}$  inch long, almost transparent. Style very thin. Fruit of about one inch measurement.

This Australian very characteristic species was known to me through a long series of years from several collections, but only from incomplete material. Early this year I was enabled through the special exertions of Mr. R. Fitzgerald to study it closely, and Mr. F. M. Bailey quite recently obtained the same plant in the southern part of Queensland. It is particularly remarkable for producing frequently a deep-red panicle of innumerable minute bracts, which are either empty or enclose undeveloping buds. It differs from *E. rubens* already in less crowded flowers of larger size on not particularly angular stalks and stalklets, also in larger fruit; from *E. oblata* in petals disunited from the commencement and in less depressed fruits.

One other plant might on this occasion be mentioned as new for Eastern Australia, namely *Dichrocephala latifolia*, lately gathered by Mr. Stephen Johnson on mountains near the Mulgrave-River.

DAMMARA PALMERSTONI.

F. v. M., "Fourth Suppl. to the Syst. Census of Austral. Plants" 4 (1889), *Agathis Palmerstoni*, F. v. M. collect.

Finally very tall ; branchlets angular ; leaves comparatively small, narrow-elliptic, but gradually narrowed into the very short petiole, blunt, somewhat oblique, slightly or hardly paler beneath ; staminal spikes ellipsoid-cylindric, solitary ; strobiles egg-shaped, their racheoles extremely numerous, broader than long, narrowly thickened at the summit.

Mount Bartle-Frere, Christie Palmerston ; Mulgrave-River, Stephen Johnson.

Mr. Johnson calls this the largest and noblest jungle tree, ascending from the river to high mountain-altitudes. So far as can be judged from the material before me, this northern Kauri Pine of Queensland is specifically distinct from the southern, which occurs on the mainland near Wide Bay and on Fraser's Island, but may also exist in North Queensland. The leaves are never lanceolar, much smaller and particularly narrower, also always obtuse, as compared to those of trees of the typical *D. robusta*, cultivated here and now fully 40 feet high. Nevertheless the specimen branchlets may all have been taken from very tall trees, and the leaves may thus become reduced in size and perhaps altered in form. The seeding strobile seems also considerably smaller and proportionately narrower ; but our collections contain it not in a fully ripe state, but it is then only 1½ inches broad. The racheoles are remarkably small, because they seem more numerons than in any other congener, as about a dozen in each transverse series can be counted on a side-view of the strobile near its middle; moreover they are almost fan-shaped. The species, here now described, seems nearest to *D. Moorei* of New Caledonia. In all cases it is preferable to use the earliest of binary names for any plant, whatever other objections can be raised, so long as it is correctly retainable within the genus first adopted. If all ante-Linnean names are to be discarded, then Agathis must precede Dammara in designating the Kauri-Pines.

The same collector brought from the same region a variety (*pleiocarpa*) of *Ackama Muelleri*, with often three and sometimes four fruitlets, and with leaflets on short stalklets. Possibly it may be a distinct species. It offers an approach to *Spiraeanthemum*.

May, 1891.

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MR. C. FRENCH, Government Entomologist, will be glad to receive specimens of noxious insects from any part of the colony in all stages of growth, with particulars of their occurrence. Specimens to be forwarded to him at his office, Exhibition Buildings, Melbourne.

## THE NEW ZEALAND VEGETABLE CATERPILLAR.

By FREDERICK A. A. SKUSE, Entomologist to the Australian Museum.

(Communicated by DR. E. P. RAMSAY, F.R.S.E., *per* C. FRENCH, F.L.S.)

IN a paper under the above title read before the Field Naturalists Club of Victoria, and appearing in the December number of the *Victorian Naturalist*, Mr. Thomas Steel states that the caterpillar referred to "is that of a handsome bright green moth, *Hepialus virescens* (Roberts)." If *Hepialus virescens*, Doubl. (Dieffenbach's "New Zealand," i., 284, 114), which was formerly classified under the generic title *Charagia*, by Walker ("Brit. Mus. Catl. Lep. Het.," vi., p. 1,569), and Scott ("Aust. Lep., 1864," p. 3, and "Trans. Ent. Soc., N.S.W.," ii., p. 28) really agrees in its habits with the Australian members of this (now considered) sub-group of *Hepialus* (and of this there can be little doubt), then it is certainly not the caterpillar of this moth which buries itself in the earth and becomes stricken with *Isaria robertsii*. It is well known that the larvæ of the Australian species of *Hepialus* (sub-group *Charagia*) undergo their metamorphoses *within the stems or trunks* of trees, vines or shrubs, &c., the mouth of the tunnel being more or less concealed by a web, and do not retire into the earth to become pupæ. I will here reproduce a note by Dr. E. P. Ramsay (who personally investigated the matter in New Zealand), quoted by Scott ("Aust. Lep.," p. 14):—" *Charagia virescens* I found in abundance near the town of Auckland, New Zealand, at the end of November, 1861, inhabiting various trees, among others 'Mahoe' of the natives. Some of the larger trees had as many as thirty habitations of the larvæ in them, the butt being literally studded with their abodes. Some were in the chrysalis state, with the bagging over the hole torn away and the entrance sealed up, as with our Australian *Charagiæ*; but the greater number were in the larval state. Those that were brought on to Sydney in the chrysalis state took wing in the middle of January, 1862. The formation of the covering to the habitation, and the way in which many of the larvæ have their tubular excavations running almost side by side, agree closely with the *C. ramsayi*. All the larvæ found were in the trunk and branches of the trees, *never in the roots*. Mr. Huntley, residing at Wellington, and a great collector of insects, asserts that the *Sphæria robertsii* is produced from the larva of a *large brown moth*." Scott then goes on to say:—" To these observations we may add that the caterpillar of *C. virescens* differs as widely in form from that bearing the *Sphæria robertsii* as do the large grey or brown moths mentioned in connection with this subject by all the authorities

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we have quoted, and corresponding with our own experience, from the brilliant and beautifully coloured Charagiæ. We, therefore, entertain the opinion that an error exists in associating the larva of the *C. virescens* with the *Sphæria robertsii*, and that it will be found hereafter that this peculiar fungus only attacks the caterpillar whose existence is passed underground, as in the case of *Pielus*, *Hepialus*, and a few others."

---

WHEN out collecting, near Gisborne, on Friday, 27<sup>th</sup> February, 1891, I noticed one of the common brown butterflies fluttering rather strangely, and on examination found that it was impaled upon a thistle prickle. The sharp prickle had entered the abdomen at one side, penetrated through, and projected fully a quarter of an inch beyond the other. On being freed the insect fluttered away, apparently not much injured. Can any member inform me how the butterfly got into such a position? It is hardly likely that, flying against the sharp point, the impetus would be sufficient to cause the prickle to penetrate the soft, yielding body, and the weather had been mild for some time previous, so a strong wind could not have been the cause.

I recollect finding one of this same species (*Xenica kluggi*) impaled in exactly the same way a season or two back. I have a hazy recollection of hearing, some years ago, that one of the insectivorous birds was in the habit of impaling its captures, with a view, I suppose, of eating them at its leisure. Perhaps one of our zoologists could enlighten me on the point.

GEO. LYELL, JUN.

Gisborne, 3<sup>rd</sup> March, 1891.

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PROFESSOR W. BALDWIN SPENCER is now engaged, in conjunction with Mr. J. J. Fletcher, of Sydney, in working out the species and the anatomical and microscopical structure of the various Australian earthworms. He will be very glad of assistance in obtaining material for this investigation. Any specimens will be duly acknowledged. They should be forwarded to him at the University, Melbourne. Earthworms are best sent by post, alive, packed with fresh moss and vegetable mould in small tin boxes. Professor Spencer will be glad of specimens from all parts of the colony, so that he may be able to give as complete an account of our earthworms as possible.

# Field Naturalists' Club of Victoria.

President:

C. A. TOPP, M.A., LL.B., F.L.S.

THIS Club was founded in 1880 for the purpose of affording observers and lovers of Natural History regular and frequent opportunities for discussing those special subjects in which they are mutually interested; for the Exhibition of Specimens; and for promoting Observations in the Field by means of Excursions to various collecting grounds around the Metropolis.

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With the view of popularising the study of the Natural History of the Colony, correspondence, notes, and queries relating to this subject are invited for insertion, and should be addressed to the Editor at the Wesley College, Prahran.

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VOL. VIII.—No. 4.

AUGUST, 1891.

# The Victorian Naturalist.

THE JOURNAL AND MAGAZINE

— OF —

The Field Naturalists' Club of Victoria.

PUBLISHED JULY 31, 1891.

The Author of each article is responsible for the facts and opinions he records.

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THE  
**Victorian Naturalist.**

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VOL. VIII.—No. 4.

AUGUST, 1891.

No. 92.

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FIELD NATURALISTS' CLUB OF VICTORIA.

THE ordinary monthly meeting of the Field Naturalists' Club was held in the Royal Society's Hall on Monday evening, 11th May, Mr. F. Wisewould occupying the chair.

The first paper was contributed by Mr. C. French, F.L.S., and formed the second of a series on "The Insectivorous Birds of Victoria." Descriptions were given of the Southern Stone Plover, the White-fronted Heron, and the Night Jar, and their usefulness as friends of the farmer, fruit-grower, and public generally was dwelt upon. In this connection an interesting exhibit was made of some 57 specimens of the common black Field Cricket, taken by Mr. A. Coles from the stomach of the White-fronted Heron. The insect has been making itself conspicuous lately by "ring-barking" orange trees; its destroyer, therefore, is worthy of all fostering care.

Mr. H. H. Baker also read a paper on "Microbes," in which he explained the nature, function, and growth of these organisms, as well as reviewed at length the researches of Pasteur, Klein, and Koch. Reference was also made to the "phagocyte" theory, according to which certain cells, similar in form and structure to the white corpuscles of the blood, and very numerous in the lymphoid tissues of the alimentary tract, eat up all the disease-producing germs which we are continually breathing in. Mr. Baker controverted this theory, on the authority of Klein. In the discussion which followed, Mr. T. Steele, F.C.S., expressed his regret that the latter theory should have had such a short life, and he was somewhat relieved when Dr. A. Dendy, in reviewing De Bary's theory of preventive inoculation, upheld the existence, nature, and function of the so-called "phagocytes." Dr. Dendy insisted on the fact that all microbes are of vegetable organization, and that many of the different so-called genera and species are probably but different stages in the life-history of the same organism. He then briefly passed in review Koch's cure for tuberculosis, in which the poisonous material formed by the consumption bacillus is dissolved in glycerine and injected into

the system, thereby destroying the bacilli by killing the surrounding tissues on which they feed. Messrs. F. G. A. Barnard, H. R. Hogg, and J. Shephard also took part in the discussion.

Amongst the natural history notes was one contributed by Mr. G. Renner on the use of the red cabbage in the manufacture of colours, and another by Mr. J. Shephard on the occurrence of a large quantity of freshwater Polyzoa and various forms of Rotifera in a large water meter belonging to the Railway Department.

The following gentlemen were duly elected as members of the club:—Messrs. H. H. Anderson, F. L. Baker, E. M. Bridges, T. P. Eckert, and C. G. Officer. Nominations were also received for office-bearers for the year 1891-2. Mr. C. Frost brought forward a motion (for consideration at the next meeting) to allow of the hon. editor being an *ex officio* member of the Executive.

The hon. librarian reported the receipt of the following additions to the library:—“Records of Australian Museum,” vol. i., No. 6; Supplement No. 1 to North’s “Nests and Eggs of Australian Birds;” “Proceedings of Royal Society of New South Wales,” xxiv., part 2; “Journal of Pharmacy,” April, 1891; “Pharmaceutical Journal of New South Wales,” March, 1891; “Annual Report, 1890, Gordon Technical College, Geelong;” “On Transverse Sections of the Petioles of Eucalypts,” by D. M’Alpine and J. R. Remfrey; “Observations on the Movements of Heart of Copperhead Snake,” by D. M’Alpine; “On a Nematode found in Copperhead Snake,” by D. M’Alpine; “On a Fluke Parasite in Copperhead Snake,” by D. M’Alpine, from author; “Report on Peach and Plum Rust” (Department of Agriculture “Guides to Growers,” No. 5), by D. M’Alpine, from author.

At the conclusion of the meeting the following exhibits were on view:—By Mr. F. G. A. Barnard.—Leaf insect from Fiji. By Mr. A. Coles.—Pair of Mandarin Ducks. By Mr. C. French, sen.—White-fronted Heron and eggs, Southern Stone Plover and eggs, Tawny-shouldered Podargus, with eggs and young (all in illustration of paper), also a remarkable scale insect new to science (*Frenchia casuarinae*, Maskell), the illustration being drawn by Mr. C. C. Brittlebank. By Mr. C. French, jun.—Eggs of the White Ibis. By Mrs. Irvine.—Dried specimens of plants, collected at the Barrier. By Mr. G. Lyell, jun.—Lepidoptera (including *Thailina inspirata* and *T. selanca*) taken at Gisborne. By Baron von Mueller.—Specimens of new Australian plants—*Diderocephalus latifolia*, D. C., from Mulgrave River, Queensland; *Erigenia fitzgeraldi*. F. v. M., from Richmond River, New South Wales; *Enodia bacilliana*, F. v. M., Barron River, Queensland; *Dammara palmerstoni*, F. v. M., Johnston River, Queensland.

## ANNUAL MEETING.

THE eleventh annual meeting of the Club was held in the Royal Society's Hall on Monday evening, 8th June, when Professor Spencer occupied the chair, and there was a very fair attendance of members and friends.

## LIBRARIAN'S REPORT.

The hon. librarian reported the following additions to the library :—“Transactions of Royal Society of Victoria,” vol. ii., part 1, from Society ; “Proceedings of Royal Society of Victoria,” vol. iii. (new series), from Society ; “Journal of New York Microscopical Society,” vol. i., part 1, vol. vii., part 2, from Society ; “Plants Indigenous and Naturalized in Neighbourhood of Sydney,” by Rev. Dr. Woolls, F.L.S., from author ; “Hints for Collection and Preservation of Herbarium Specimens, &c.,” by J. E. Brown, F.L.S., from Forest Department, New South Wales ; “Journal of Pharmacy,” May, 1891.

On a ballot being taken, Mrs. M. C. Bridger and Mr. J. M. Ashworth were elected as members of the Club.

## ALTERATION OF RULE 10.

Mr. C. Frost brought forward his motion, which he had duly given notice of at the previous meeting, relative to the addition of a clause to rule 10, having the effect of making the editor of the *Victorian Naturalist* an *ex officio* member of the Executive of the Club. He explained very clearly the nature and reason for the addition, and the motion having been duly seconded by Mr. F. G. A. Barnard, was carried unanimously.

## ANNUAL REPORT AND BALANCE-SHEET.

The annual report was read by the hon. secretary, Mr. D. Le Souëf, and showed that some 30 papers and reports had been communicated to the club during the past year. It then referred specially to the good work done during the various excursions, notably those to the Kent Group, Yarra Falls, and Mount Wellington (Gippsland) district. The exhibition of wild flowers held in October last proved a success, as did also the *conversazione* of last month. The roll of members shows a total of 220, and the library list more than 500 volumes.

On the motion of Mr. J. G. Luehmann, seconded by Mr. J. Shephard, the report was unanimously accepted by the meeting. The annual balance-sheet was then presented by the hon. treasurer, Mr. D. Best, and on the motion of Mr. H. R. Hogg, seconded by Mr. H. Kendall, was accepted by the members.

## OFFICE-BEARERS FOR THE YEAR 1891-2.

The annual election of office-bearers then took place, with the following result :—President, Professor W. B. Spencer, M.A.;

vice-presidents—Mr. D. Best and Mr. C. Frost; hon. treasurer, Mr. F. Wisewould; hon. librarian, Mr. F. G. A. Barnard; hon. secretaries—Mr. D. Le Souëf and Rev. W. Fielder; committee—Dr. A. Dendy, F.L.S.; Messrs. C. French, F.L.S., J. Gabriel, T. Steel, F.C.S., and H. T. Tisdall, F.L.S., whilst Mr. A. H. S. Lucas, M.A., B.Sc., will be an *ex officio* member as editor of the *Victorian Naturalist*.

#### NATURAL HISTORY NOTES.

Mr. G. Renner had brought an exhibit of some simple and compound colours extracted from the leaves of the red cabbage, and at the invitation of the secretary he explained in detail the manufacture of these colours.

Mr. H. T. Tisdall, F.L.S., brought under the notice of the meeting the great height attained by the common Sassafras (sometimes reaching 150 feet) in some parts of the colony, and his remarks were corroborated by Messrs. C. French, F.L.S., and J. E. Prince, as to their own observations in Gippsland and Marysville.

Mr. G. A. Keartland solicited information as to the length of the period of dormancy of snakes in winter, basing his question on the fact of his meeting with a lively specimen in a late ramble. Mr. D. Le Souëf stated that climatic conditions had a great deal to do with the period of their hibernation, and Messrs. C. Frost and A. Coles spoke to the same effect.

#### EXHIBITION OF SPECIMENS.

The meeting then terminated with the usual exhibition of specimens, of which the following is a list:—By Mr. F. G. A. Barnard.—Specimens of King Lory and Barraband's Parrakeet from Clarence River. By Mr. C. French.—Rare moths from Lilydale and British Lepidoptera. By Mr. C. French, jun.—Eggs of Australian Gannet, from Tasmania. By Mr. J. E. Prince.—Pacho's "Travels in Tripoli," and "Native Flowers of India." By Baron von Mueller.—*Senecio dryadeus* (var. *garlandi*), from Wagga Wagga. By Mr. G. Renner.—Simple and compound colours extracted from leaves of the red cabbage. By Mr. J. Shephard.—Living and mounted specimens of *Apus* (one being the embryo) and Rotifera. By Mr. D. Le Souëf.—Bush Rat from Maldon, and eggs of the Tiger Snake.

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#### CLUB EXCURSION TO MACEDON

(FOUNDATION DAY, 26TH JANUARY).

To attend this excursion necessitated rising at a somewhat early hour, the starting time being half-past six in the morning, at Spencer-street, which involved leaving suburban stations about a quarter to six.

At the appointed time, two members exchanged salutations outside the booking office, amid a very miscellaneous crowd, mostly equipped with still more miscellaneous weapons, some of which, by their appearance, might have landed at the historic event that formed the excuse for the holiday being celebrated.

After waiting without result to the last possible minute for the appearance of fellow members, seats were secured, and the train was soon whirling along through the burnt-up and bare-looking country stretching on either side for the greater portion of the journey. At Sunbury all heads were craned to see the residence of Sir William Clarke and its beautiful surroundings, the little lake, with a gondola floating idly on its unruffled surface, exciting feelings of longing in the breast of one of the party, who would have liked a jar full of the water for quiet examination at home.

Macedon reached, an agreeable surprise awaited us in the shape of fellow members, bringing up the total number to seven, two having been in the train, two having walked across from Woodend, and Mr. Hogg being resident in the district. Learning from him that our appointed leader, Mr. Frost, was unavoidably compelled to be absent, we gladly placed ourselves under his guidance, and were soon seated in a cab, making for the hotel, where the travellers from town were not sorry to have some breakfast. This over, they rejoined the party, who had made their way to the Williconcon Creek, and a start was made along its course.

Log-rolling for planarian worms soon commenced, but few were obtained at first. Entomological specimens were also keenly sought after, but only a common Crambus observed. Gradually we began to mount upward, leaving the creek below, the path being somewhat rough, with here and there a fallen tree stretched across, under which we had to stoop, or else clamber over. On the slope between the track and the creek was a considerable amount of fallen timber, and the planarian hunters began to be somewhat more successful. Some scorpions and myriapods were also captured.

By the side of the path, a colony of the beautiful little Bronze Long-horn Moth (*Adela*) were observed, occupied in their characteristic mazy flight in the bright sunshine, rising and falling in much the same manner as a column of midges on a summer's evening. One sweep of the net secured sufficient to ensure a series, and once more progress was resumed, until we reached a secluded and shaded spot, which gave our ornithologist his first chance, specimens of the Mountain Thrush and Rufous-fronted Flycatcher being secured.

After more walking, which would have been fatiguing had it not been for the cool breeze, we emerged upon a small clearing, in which a couple of cottages were erected, occupied by the

woodmen employed on the mount. In the cleared space around these a few Tortrices were obtained, and one specimen of the sober-looking Dingy Forester (*Procris doloris*). Shortly afterwards we came upon the site of an old sawmill, which, however, had completely disappeared, owing to the devouring ravages of a fire.

Striking off the path, we entered upon what had once formed the dam to the mill, now carpeted with grass, with a murmuring stream running through the centre; here a halt was made, and, selecting a spot where some blackwood and wattle trees combined to throw a dense shade, we got out our lunch, and refreshed ourselves with the cool and pleasant water of the brook. While resting here, several of the apterous females of the Hymenopterous genus *Thynnus* were noticed, their large mandibles giving them a very ferocious appearance.

Up to this time, the results of the day's work, from a collecting point of view, had not been very great, but after lunch and an indulgence in the fragrant weed, fresh efforts were made and speedily disclosed the fact that we had reached, and been resting in, a perfect little oasis. A council of war being held, it was decided by the members from town to remain and work the spot during the afternoon. Mr. Hogg returned home, and the two visitors from Woodend also set off round the "Camel's Hump" on their homeward journey.

The result of the afternoon's collecting was highly satisfactory, the beautiful and local Cone-bar Carpet Moth (*Chrysolarentia conifasciata*) being met with in considerable numbers, also a species, probably of the genus *Cidaria*, not yet named, though previously recorded from Fernshaw, and four specimens of a large-sized *Acidalia*, which I think may prove new.

*Nyctemera amica*, *Spilosoma obliqua*, and several species of Micro-lepidoptera, including one of the Pterophori, or Plume Moths, were also observed, while Rev. W. Fielder and his helpers obtained, altogether, seven species of planarians, recognized by Dr. Dendy as:—*Geoplana mediolineata*, *G. alba*, *G. adæ*, *G. sugdeni*, *G. hoggii*, *G. fletcheri*, *G. quadrangulata*, and a *Peripatus (insignis)* similar to those previously found by Mr. Hogg.

But our time being up, we were compelled to start on our way to the station, which we reached on foot, after a good tramp along a typical dusty road. The train left at 5.40 p.m., and, though most carriages were very full, we were fortunate to secure a comfortable ride to Melbourne, the party finally breaking up at Flinders-street station, after a very enjoyable day together.

E. ANDERSON.

## ANNUAL CONVERSAZIONE.

THE tenth annual conversazione of the Club was held in the Athenæum Hall on Thursday evening, 28th May.

A large audience assembled in the upper hall at 8 o'clock to hear the annual address delivered by the retiring president, Mr. C. A. Topp, M.A., LL.B., F.L.S.; the chair being taken by Baron von Mueller, K.C.M.G., one of the patrons of the Club.

The following is the text of that address :—

LADIES AND GENTLEMEN,—I have the honour, as president of the Club, to make the customary annual summary of our proceedings during the past year—the eleventh of the Club's life—and to make brief allusion to the principal matters outside our Club's proceedings of interest to Victorian naturalists.

Perhaps I may be permitted, before proceeding with my pleasant duty, to express regret that during the past year I have had reluctantly to absent myself from so many meetings of the Club, and have not, therefore, that intimate knowledge of its doings which it is so desirable that its office-bearers should have; perhaps still more have I felt my compulsory abstention from those pleasant fortnightly gatherings of members by the riverside or seashore on Saturday afternoons which I have always considered the essential feature of a field naturalists' club, and which, I think a year ago, I urged as many members as possible to attend, and spoke of as, in some respects, of more importance than the monthly meetings.

I can only assure members, in reference to this matter, that my absence has been in no way due to any failing of interest in the welfare of the Club, still less to any change of views as to the pleasure and educative value of that outdoor study of nature in all her moods, and of that training in observation and in patient watching, and cautious reasoning from observed facts which intelligent collecting and field excursions should give, or as to the benefits derived from that comparison of observations and of specimens, from that contribution to a common stock of experimental knowledge in different though allied sciences by different workers, which is afforded by our monthly meetings. So keenly do I feel how desirable it is that the principal officers of this Club should in every way, and by example much more than by precept, encourage and stimulate their fellow members in following the paths to knowledge which our Club opens to its members, that I should have felt it my duty to resign my office had I not felt that a president elected in the middle of the year is placed in a rather unfair position, and had I not hoped that those public and urgent duties which have kept me away from your meetings might so diminish as to give me leisure to take again an active part at your meetings and excursions.

The most important field work accomplished by the Club during the past year has been in connection with the excursions to the Kent Group of Islands and to the Upper Yarra, and I think it is a matter for congratulation that these somewhat prolonged excursions seem now to be firmly established as a necessary part of the annual doings of the club.

It is scarcely necessary to point out that the more elaborate organization necessary when a party of half-a-dozen to a dozen determines to penetrate the wilds of our bush, and live under canvas for a week or two, remote from stores and hotels, gives a training in many matters essential to the success of a naturalist, which necessarily cannot be afforded by the afternoon or even by the day collecting trip.

So that, apart from the actual results gained by each excursion of this character in the shape of new species of fauna or flora discovered and new knowledge acquired of geographical distribution, such trips as those to the Upper Yarra and to the Kent Island of the past year, and those to Eastern Gippsland and King's Islands in preceding years, promote one of the objects of this Club in giving young naturalists a training and experience which will be of value to those of them who in later life may take up on a larger scale the study of natural history in unexplored, or at least unsettled, portions of this continent or of other lands.

The Kent Group visit was arranged to determine the question as to whether that group of islands is more nearly related to Victoria, with which it is closest geographically, or with the more remote land of Tasmania, as well as for the collecting of specimens. The party numbered seven, and the trip took place in last November, was favoured by fine weather, and fulfilled expectations. The bulk of the fauna and flora was found to be common to Victoria and Tasmania, but there were six or seven varieties of birds peculiar to Tasmania to two peculiar to Victoria. The conclusion was that the islands had been separated from Tasmania after that island was disjoined from the mainland. Among the plants several forms were found varying somewhat from the typical forms of the same species on the mainland; while it was interesting to find that the arboreal Short-eared Opossum had changed his habits so far as not to feed on the leaves of the eucalypt, and to keep to the ground. Whether the flavour of his flesh were changed, or his tail had become less muscular and his claws less powerful, the report sayeth not.

The visit to the Yarra Falls was made at the end of November by six members of the Club, unfortunately under most unfavourable conditions of weather, both for enjoyment and for collecting and for observations. Notwithstanding this disadvantage a considerable amount of collecting was accomplished, and the knowledge of one of the most beautiful and interesting portions of our

territory was extended. It is probable that the reports brought back of the grandeur of the forest scenery and the sublimity of the falls will tempt another visit to the Yarra Falls at no distant date. Three new animals were also added to science, two being Planarian Worms and one a worm related to the now familiar Giant Earthworm of Gippsland.

Though not strictly a Club excursion, the visit of Messrs. Howitt, Dendy, and Lucas, members of our Club, to the Mount Wellington district in Gippsland, a report of which was read at the February meeting, may be properly mentioned. This visit was undertaken for the purpose of investigating the formation of one of the too rare mountain lakes of Victoria, the origin of which is somewhat obscure. During this expedition a probably new characeous plant was collected, as well as a new toad, a new planarian, a new variety of crayfish, and a new fish.

It is encouraging to notice that during the past twelve months the diligent collecting and trained observation of members of our Club have resulted in the addition of several new species of animals and plants to the Victorian fauna and flora. Instances have been given in connection with the collecting trips I have just mentioned. Besides these I may mention that Mr. Howitt has described a new gum tree eucalypt, from Gippsland; that Mr. Tisdall has discovered six new Agarici and one *Hygrophorus*; Mr. Gatliff has described a new *Conus*, from Western Port; Mr. M'Kibbin has found a new orchid, described by Baron von Mueller as *Thelymitra elizabethae*; Mr. French two new genera and seven new species of scale insects (published by Mr. Maskell in the "Transactions of the New Zealand Institute"). These facts show that even in so long a settled and well explored country as Victoria there is scope for the discovery of a new form of life, apart from the many interesting problems of distribution and life-history which in regard to many groups have scarcely yet been attacked, and some of which, from their requiring close and prolonged observation rather than technical training, are peculiarly suitable for the members of this Club.

Besides the reports of the visit to the Kent Group of Islands and to the Yarra Falls, which occupied three numbers of the *Victorian Naturalist* during the past year, various other papers of interest have been read at our meetings, and subsequently published in that journal.

Mr. C. French, F.L.S., has commenced a series of papers of great practical value on the insectivorous birds of Australia. Part i., treating of the Australian Bustard, was published in the March number, and it must be a satisfaction to all lovers of our avifauna to learn that this beautiful and useful bird, which has diminished in numbers so rapidly that its early extinction seemed probable, has now been permanently protected by law, through

the representations of Mr. French, supported by the Council of the Zoological Society. Mr. French also contributed two general papers describing plants and insects met with in excursions near Melbourne—a subject he is well able to deal with. A paper of a similar character, relating to the district around Pyramid Hill, contributed by the Mr. E. H. Hennell, appeared in the October number of the *Naturalist*. Four papers have been read on entomological subjects—one by Mr. Frost, on the bite of *Latrodectus scelio*; one by Mr. G. Steele, on the Vegetable Caterpillar of New Zealand; one by Mr. James Lidgett, on the sagacity of insects; one by Mr. C. French, on the geographical distribution of some Australian Buprestidæ.

The botanical papers have not been so numerous as usual. Mr. Tisdall has described Victorian fungs new to science. Mr. G. P. Eckert has contributed an interesting note on spontaneous periodic oscillation of *Pterostylis mitchelli*, var. *rufa*. The paper, though short, is highly suggestive, and seems to open up a field for further investigation.

It is a matter, I think, for regret that geology still continues in the background. One interesting paper on the geology of the Moonee Ponds district was, however, read by Mr. T. S. Hall.

New ground—if the expression be allowable—is broken in Mr. J. Shephard's "An Afternoon's Pond Hunting," in which some free-swimming and tube-building Rotifers are described.

Baron von Mueller has continued to publish in the journal descriptions of new Australian plants; these include two new genera from tropical Australia, from Mt. Bartle Frere (the one *Haplostichanthus*, of the order Anonaceæ, the other *Schistocarpea*, of the order Rhamnaceæ); a new eucalypt (*E. bauerleni*) from the Sugarloaf Mt.; a *Thismia (rodwayi)* from the Derwent (Tasmania), remarkable as the only extra-tropical species of the order Burmaniaceæ in the Eastern Hemisphere.

Our annual wild flower show was held on the 6th October, and the collections were so large that the table space was scarcely adequate for their proper exhibition, and they formed, I think, a completer exhibition of spring flowers, from all parts of the colony, than has yet been shown, collections having been sent from Gippsland, from the Wimmera, from the neighbourhood of the Murray, and from the North-East, in addition to those from the vicinity of Melbourne. No less than 115 genera were represented, comprising about 185 species.

Turning now from the doings of the Club, I will very briefly draw attention to a few other matters and publications of interest to members as connected with Australian natural history. I mentioned last year that our distinguished patron, Baron von Mueller, had commenced the publication of a series of descriptive plates on the Salsolaceæ of Australia. Six numbers have now

been published. The Baron is again engaged in the revision of a new edition (the eighth) of his "Select Extra-tropical Plants Eligible for Industrial Culture." So great seems to be the demand for this work, that the preparation of a new edition seems to be a standing order with its eminent author.

It was anticipated last year that Mr. French's "Handbook of the Destructive Insects of Victoria," part i.,\* would very shortly be published. That anticipation has not been realized, owing to unforeseen delays in connection with the printing and the preparation of the plates. Mr. French, however, informs me that the work is now in type and will consist of 160 pages of letterpress, 14 coloured plates, besides engravings. Part ii. is also well advanced. Mr. French is also engaged on a treatise on the locust plague in Victoria, which will be illustrated with plates, giving the life-history of the locust. These works, besides their primary practical value to agriculturists, will, we may hope, help to popularize the study of entomology.

The "Transactions of the Royal Society of Victoria," for 1890, contain a valuable essay on the eucalypts of Gippsland, by Mr. A. W. Howitt, well worth the perusal of the members of this Club who take an interest in botany. Mr. Howitt, after describing the various marked varieties of the several species of this genus found in Gippsland, proceeds to describe their distribution, and to account for this by climatic and geological considerations. Mr. Howitt also shows how settlement has influenced the Eucalyptus forests in two opposite ways.

The same volume contains another botanical paper—namely, one on the determination of the species of eucalypts by the microscopical characters of the transverse sections of the petioles, by Mr. D. M'Alpine. This paper suggests a very interesting field of investigation in botanical microscopy, for which there is room for an unlimited number of workers.

The same volume contains papers which it would be presumption in me to more than refer to, by our eminent members, Professor Spencer and Dr. Dendy; but I may mention that the plates to Dr. Dendy's paper in the "Transactions," and those to Professor Spencer's paper in the "Proceedings of the Royal Society," will enable collectors to readily identify nearly all of the known species of Victorian Land Planarians.

In the "Proceedings of the Royal Society," for 1890, will be found a paper by our well-known member, Mr. A. J. Campbell, in which he describes the nests and eggs of birds met with by him during a recent visit to Western Australia. In this paper 9 new eggs are, for the first time, described and figured in colours. Mr. Campbell's paper is followed by one read by another of our

\* This work has since been published, and has met with very favourable criticism on all sides.

members, Mr. A. H. S. Lucas, in which four new species of fish found in Victorian waters are described and figured. To those of our members who take an interest in geology, the paper by Mr. John Dennant, F.G.S. (another of our members), on Miocene strata and the older Tertiary, near Bairnsdale, may be commended.

Entomological papers are entirely absent from the proceedings of our Royal Society; but those of us who take an interest in this department of biology will find abundant material recorded in the "Proceedings of the Linnean Society of New South Wales," for the past year. These contain "Studies in Australian Entomology," by a former member, Mr. T. G. Sloane. Mr. F. A. A. Skuse continues his monograph on Australian Diptera, and Mr. Miskin and Mr. Meyrick contribute papers dealing with certain sections of the Lepidoptera. Mr. Olliff and Mr. Blackburn continue their papers on the Coleoptera, and Mr. Froggatt commences a catalogue of Australian Hymenoptera.

It is satisfactory to learn, from the annual report of the Mining Department just issued, that arrangements have now been made for a continuance of a systematic geological survey of the colony. The fact that so excellent a geologist as Mr. A. W. Howitt is now the head of the Mining Department is a guarantee that this work, so desirable both from a scientific and practical point of view, will be thoroughly and exactly carried out.

As of interest to naturalists I may make reference to two explorations which it may be hoped before long will give results of great scientific interest. The one—that organized by the liberality of Sir Thomas Elder—will, it may confidently be expected, render more complete our knowledge of the geology, meteorology, fauna and flora of a considerable extent of the interior of this continent, which has not yet been carefully and systematically examined, and a large portion of which has not yet been traversed. The other—of larger importance, greater magnitude, and appealing more strongly to the imagination—the proposed Antarctic exploration, under Baron von Nordenskiold's leadership, is yet only in the preparatory stage, but the interest in it felt by naturalists will be naturally so keen that I cannot do better than conclude this address by giving some information in regard to the progress made up to this date in the organization of this great undertaking—information which I give on the authority and by the courtesy of Baron von Mueller, who has been and is exerting himself untiringly in furthering this work. Baron von Mueller states that the progress of arrangements for renewed South Polar exploration has been continued with more and more success, chiefly through the exertions of the Antarctic Committee. In the other colonies also a vivid interest in this long-deferred but promising object is evinced. The

Government of New South Wales is providing £2,000, that of Queensland £1,000, that of Tasmania £500, while the Governments of the other Australian colonies are considering to what extent Government aid can be given. These amounts are irrespective of private contributions towards this great enterprise, which amount to nearly £1,500. It appears from public statements made by Baron Oscar Dickson during his visit to London some few months ago, that the funds necessary for an effective Antarctic expedition should not be less than £15,000, of which Baron Dickson will himself provide £5,000. "With this sum steamers can be purchased and so thoroughly equipped as to render the Swedish-Australian expedition one likely to yield grand results, not only in science in many directions, but also in commerce and industry, by initiating by definite reconnoitering whaling and sealing by subsequent steamers in regions never touched since creation, and yet comparatively near to Australia." Baron von Mueller continues:—"It is, however, not generally recognized here how much depends on us collecting our monetary forces so as to enable Baron von Nordenskiold, the illustrious accomplisher of the eastern passage through the Arctic Sea, to get ready, during the present northern summer and autumn, with all needful strengthening and scientific fittings, the two ships, which ought for safety to keep company, in order that he with his companions may leave Sweden as soon as the ice breaks up, early next year, so as to reach Australian ports before the middle of 1892, where he could receive the Government subsidies and other monetary contributions and scientific assistance. It would then be possible for him to form the *depôt* at Macquarie Island not later than September, with the full nightless season before him. If the required aid cannot be fully secured very soon then clearly the season of 1892-93 will be lost for the expedition." Baron von Mueller further points out that in this association of naturalists here the objects in which we are particularly interested must be any of the physiographic researches, and that while the celebrated leader will resume the great geographic, meteorological, and magnetic observations of Sir James Ross in the *Erebus* and *Terror* expedition with the advantage of steam power for navigation and other auxiliary means of modern times, at least two Australian specialists as representatives of biology and geology will accompany the Nordenskiold expedition. Thus, the undertaking is of great significance to the association of field naturalists, and we may hope thus to promote effectively the success of what bids fair to become a historic enterprise.

At the conclusion of the address, Baron von Mueller added a few words respecting the Club and the proposed expedition to the Antarctic regions, and then moved a hearty vote of thanks to

Mr. Topp for his work as president of the Club, and for the excellent address which he had just delivered. The vote of thanks was carried with enthusiasm, and was acknowledged by Mr. Topp.

Then followed an exhibition of lantern slides in illustration of excursions undertaken by members of the Club during the past year. Those illustrating the Yarra Falls trip were explained by Professor Spencer; the next series were illustrative of the visit to the Mt. Wellington District (Gippsland), and were explained by Dr. A. Dendy, whilst Mr. D. Le Souëf acted as the exponent of the visit to the Kent Group of Islands.

After this part of the programme was concluded the audience adjourned to the lower hall, in which a large collection of exhibits in illustration of the animal, vegetable, and mineral kingdoms were arranged. Visitors to the number of some 700 honoured the Club by their presence, and rewarded exhibitors by the marked and appreciative interest with which the various exhibits were examined.

The following is a list of exhibitors, with particulars of the various specimens exhibited by them:—

ANDERSON, E., Armadale—Contributions to the Life Histories of Victorian Lepidoptera (figures of several stages of 40 species). Specimens of Victorian Lepidoptera, collected near Melbourne during 1890–91.

ANDERSON, P. H., Malvern—Mounted microscopic objects (chiefly illustrating the structure of insects).

ASHWORTH, H. P. C., Glenferrie—Case of Birds' Eggs and Butterflies, and specimens of Stuffed Birds.

BARNARD, F. G. A., Kew—Cases of Australian Insects.

BAKER, H. H., Melbourne—Microscopes and rare specimens of Diatoms. Stereoscopes and Views.

BEST, D., Hawthorn—Collection of Australian Coleoptera.

CAMPBELL, A. J., F.L.S., Armadale—Photographs of Sassafras Gully and Werribee Gorge.

COLES, A., Melbourne—Case of Australian Birds (Waders, Ducks, Parrots, &c.) Case of Mountain Ducks, with young and eggs. The Home of the Platypus. A variety of specimens illustrative of Australian Fauna.

COCHRANE, Miss S. W. L., Auburn—Collection of Victorian Orchids and other Wild Flowers painted on dark panel-shaped cards.

DIXON, J. E., Oakleigh—Cases of Victorian Fossils, containing specimens from Older Pliocene (Cheltenham), Miocene Tertiary (Jan Juc Beach), Pleistocene (Fisherman's Bend), Oligocene, Lower Pliocene, and Silurian Formations.

FRENCH, C., F.I.S., South Yarra—Cases of Australian and Exotic Butterflies and Beetles. Specimens of Victorian Insectivorous Birds, with eggs and young. Chart of Noxious Insects. Sorauer's illustrations of Injurious Fungi. *Vedalia cardinalis* (drawings from Nature and perfect insects).

FRENCH, C., jun., South Yarra—Case of Sea Birds' Eggs.

FIELDER, Rev. W., St. Kilda—Types of the Hydroïd Family (living and mounted specimens).

FROST, C., East Kew—Twenty-five species Australian Lizards.

FLATOW, Mrs., Carlton—Collection of Shells, Sponges, and Polyzoa.

HILL, W. H. F., Windsor—Case of Lepidoptera. Case of Hymenoptera.

HOGG, H. R., Melbourne—Microscopic Objects (living).

IRVINE, Mrs., St. Kilda—Collection of Dried Wild Flowers and Everlastings from Western Australian and Barrier Ranges, N.S.W.

JENNINGS, W. B., Prahran—Fossil Shells, Sharks' Teeth, Whales' Ear-bones, &c., from Hamilton, Waurn Ponds, and Cheltenham.

KERSHAW, W., Windsor—Two Cases of Australian Lepidoptera. Two Cases of Foreign Lepidoptera. Collection of Australian and New Guinea Birds.

KEARLAND, G. A., North Carlton—200 Varieties of Birds' Eggs. Birds, Reptiles, Sea-shells, &c.

LE SOUER, D., Parkville—Collection of Victorian Eggs. Case of Kent Group Specimens. Giant Sponges. Two Shells (weight, 3½ cwt.) Various Specimens in spirit.

LUCAS, A. H. S., M.A., B.Sc., South Yarra—Australian Lizards and Fish, and Various Diagrams.

LYELL, G., jun., South Melbourne—Cases of Victorian Butterflies and Moths.

MUELLER, Baron F. von, K.C.M.G., South Yarra—New Australian Plants (amongst them being a new Eugenia, *E. fitzgeraldi*, from N.S.W.), also Six Decades (illustrations of Salsolaceous Plants of Australia).

MARTIN, Mrs., North Brighton—Drawings of some Fungus Diseases of Economic Plants.

M'KIBBON, J. N., South Yarra—Case Queensland Lepidoptera. Case British Lepidoptera. Two cases Victorian Lepidoptera. Case Australasian Coleoptera. Case Victorian Coleoptera.

PRINCE, J. E., Windsor—Cook's Voyage and Charts, published by Admiralty, 1768. First Records of London Missionary Society, with collections of Cook's Charts. Section of Strata of Melbourne 145 feet in depth, with traces of gold formation.

ROYAL GEOGRAPHICAL SOCIETY OF AUSTRALASIA (Victorian branch)—Birds, Snakes, Lizards, and Insects collected by the expedition to Mount Yule, New Guinea.

ROBERTS, Miss, Hawthorn—Collection of Victorian Sponges. Victorian Seaweed Pictures.

SPENCER, Professor W. Baldwin, M.A., University—Specimens (chiefly from Naples) and Apparatus from Biological School, Melbourne University. Section Cutting Machine, at work.

SHEPHERD, J., Brighton—Infusoria and Rotifera (for microscopical examination).

TISDALE, H. T., F.L.S., Toorak—Mountings and Coloured Drawings of Victorian Fungi.

WING, J., Collingwood—Specimens of Fossiliferous Formation, taken from 100 feet deep in sinking a water shaft.

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#### CORRESPONDENCE.

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#### *POLYTELIS ALEXANDRÆ, OR PRINCESS OF WALES PARRAKEET.*

*To the Editor of the Victorian Naturalist.*

SIR,—Late last night I received the February number of the *Victorian Naturalist*, and read therein with the deepest interest Mr. Symonds Clark's description of the two live specimens of the Princess of Wales Parrakeet brought to Adelaide last year from the neighbourhood of Charlotte Waters.

On comparing his description with specimens of the *Polytelis melanura* and *P. barrabandi* in my collection, what struck me

forcibly was the fact that the above birds were exactly in colour, &c., what I should expect to find from a cross between these two species of the same genus.

I have seen several crosses in the wild state between Parrakeets of different genera, therefore those of the same genus mating would not be so peculiar.

It may be stated that Charlotte Waters or Howell's Ponds are not the habitat of either species of *Polytelis*, but my experience convinces me that you cannot fix any locality, especially on a continent, as the sole habitat of members of the great *Psittacidae* family.

From what I know of the parrot family it would not astonish me to learn that a pair of birds of even different genera had brought forth young for over twenty-eight years within a day or two's journey of the same locality.

I shall be only too pleased to feel certain that I am wrong in my suggestion of these birds being "hybrids," for although I have long known of the bird by name I have never seen it, and it always gives me a thrill of delight when I hear of a new Australian species, or when I read again the names, in print, of Leichhardt, Burke, Wills, Bauer, Stuart, Giles, Forrest, and others of our Australians, who have never been equalled, in any other land, as explorers.—I am, &c.,

T. AUGUSTUS FORBES-LEITH.

Surrey, England, 17th February, 1891.

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WE are obliged from pressure on our space to refrain from giving a review of the "Handbook of the Destructive Insects of Victoria," part 1, by Mr. C. French, F.L.S. In one of his letters from Selborne, one hundred and twenty years since, Gilbert White writes:—"A full history of noxious insects, hurtful in the field, garden, and house, suggesting all the known and likely means of destroying them, would be allowed by the public to be a most useful and important work. Great improvements would soon follow, of course." This is the work Mr. French is laying himself out to do for Victoria, and from a study of his first instalment we conclude that he intends to do it in such a graphic manner that the farmers and fruit-growers will be able to very easily identify their enemies, and be directed to the best means available wherewith to combat them. We have faith in White's prophecy that "great improvements will follow" the publication and diffusion of the handbook. We would also congratulate Mr. C. C. Brittlebank on the accuracy and beauty of his coloured drawings.

# Field Naturalists' Club of Victoria.

President:

C. A. TOPP, M.A., LL.B., F.L.S.

THIS Club was founded in 1880 for the purpose of affording observers and lovers of Natural History regular and frequent opportunities for discussing those special subjects in which they are mutually interested; for the Exhibition of Specimens; and for promoting Observations in the Field by means of Excursions to various collecting grounds around the Metropolis.

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The proceedings of the Club are recorded in its journal—the "Victorian Naturalist." Annual Subscription, 6s. 6d., post free. (To members free.)

With the view of popularising the study of the Natural History of the Colouy, correspondence, notes, and queries relating to this subject are invited for insertion, and should be addressed to the Editor at the Wesley College, Prahran.

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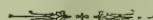
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JAN 11 1891

VOL. VIII.—NO. 5.

SEPTEMBER, 1891.

# The Victorian Naturalist:

THE JOURNAL AND MAGAZINE

— OF —

The Field Naturalists' Club of Victoria.

PUBLISHED SEPT. 7, 1891.

Editor: A. H. S. LUCAS, M.A., B.Sc.

The Author of each article is responsible for the facts and opinions he records.

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THE  
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VOL. VIII.—No. 5. SEPTEMBER, 1891. No. 93.

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FIELD NATURALISTS' CLUB OF VICTORIA.

THE ordinary monthly meeting of the Field Naturalists' Club was held in the Royal Society's Hall on Monday evening, 13th July. Professor W. Baldwin Spencer occupied the chair, and there was a very good attendance of members and friends.

LIBRARIAN'S REPORT.

The hon. librarian reported the following additions to the library:—"Quarterly Mining Reports," March, 1891, and "Annual Report, Mining Department," 1890, from Mines Department; "Handbook of Destructive Insects of Victoria," part 1, by C. French, F.L.S., from Department of Agriculture; "President's Address to Royal Society, New South Wales," May, 1891, from Society; "Records Australian Museum," i., 7, from Museum; "Catalogue Described Hymenoptera of Australia," by W. W. Froggatt, from author; "Journal of Bombay Natural History Society," v., 4, from Society; "Journal of Pharmacy," June, 1891; "Transactions Royal Society Victoria," iii., part 1, from Royal Society; "Contributions to Queensland Flora," by F. M. Bailey, F.L.S., being Bulletin No. 9, Department of Agriculture, from Department of Agriculture, Queensland.

ELECTION OF MEMBERS.

The usual ballot of new members took place, the following being unanimously elected:—Mrs. C. French and Messrs. E. Boulter, H. C. Crofts, P. Dattari, C. Draper, S. Plowman, F.R.C.S., C. A. E. Price, J. V. Smith, C. Troedel, and T. J. Watts.

GENERAL BUSINESS.

Before the usual papers were read, the President moved that the congratulations of the members of the Club be tendered to Mr. C. French, F.L.S., on the successful issue of his book, "The Destructive Insects of Victoria," part 1. After Mrs. Martin had advanced some adverse criticisms on the work, the congratulatory motion was carried with acclamation.

Mr. F. G. A. Barnard then alluded to the great loss the Club had sustained by the recent death of Mr. Edward Bage, jun., one of the life members of the Club, and the Secretary was requested

to write a letter of condolence and sympathy to Mrs. Bage. Mr. C. French supported this motion, which was carried unanimously.

#### PAPERS.

The only paper of the evening was communicated by Dr. A. Dendy, F.L.S., on "An Introduction to the Study of Sponges," and partook of the nature of a lecturette, which, being illustrated by diagrams and many beautiful specimens, was followed with interest by everyone present. Typical examples of the two great divisions of sponges—calcareous and non-calcareous—were cited, and their structure, both external and internal, was dwelt upon in detail. The description of the canal system and general anatomy of the ordinary bath sponge (*Euspongia officinalis*) was specially interesting, and a very fine example, dredged near the Heads, was shown in illustration. A large number of mounted sections, illustrating the method of microscopical examination of sponges, was also exhibited.

#### NATURAL HISTORY NOTES.

Messrs. T. G. Luehmann and C. French, F.L.S., read a note on, and exhibited the skin of, a tree-climbing kangaroo from Northern Queensland. Other notes were communicated by Messrs. F. G. A. Barnard, E. H. Hennell, T. Steel, F.C.S., and J. Shephard. The latter described a very beautiful specimen of a social form of Rotifera, captured by Mr. W. Mann at Heidelberg—probably a new species of *Lacinularia*, or a variety of *L. socialis*.

#### EXHIBITS.

The meeting terminated with the usual exhibition of specimens, of which the following is a list:—By Dr. A. Dendy.—Specimens of Victorian sponges. By Mr. C. French, jun.—Eggs of the Marsh Tern (*Hydrochelidon fluvialis*), from Colac, Victoria, and of the Bass' Straits Tern (*Thalasscus poliocercus*), from Tasmania. By Rev. W. Fielder.—Specimens collected on the Elwood beach after the recent storm (including *Ibacus peronii*, Nudibranchiata, Octopoda, Gephyreans, Prawns, Chitons, and Holothuroids). By Mr. S. O. Grundt.—Album containing specimens of Arctic vegetation. By Mr. R. Hall.—Mole from Scotland. By Messrs. T. G. Luehmann and C. French.—Dendrolagus from N. Queensland. By Mr. W. M'Gillivray.—Perfect snake slough (found by Mr. E. Crellin). By Baron von Mueller.—Several new or very rare plants, some from Mr. J. Bradshaw's recent expedition to Prince Regent's River, belonging to the genera Sloanea, Hibiscus, Celastrus, Spermacoce, Eriachne, Andropogon; also, *Hypoestes moschata*, discovered by Mr. Holtze in Arnhem's Land, and remarkable for its very strong musk scent. By Mr. T. Shephard.—Mounted specimens of a Rotifer (probably a new species of *Lacinularia*).

The ordinary meeting of the Club was held in the Royal Society's Hall on Monday evening, 10th August. Professor W. Baldwin Spencer was in the chair, and there was a good attendance of members and friends.

#### LIBRARIAN'S REPORT.

The hon. librarian reported the following additions to the library :—"Proceedings of Academy of Natural Science, Philadelphia," part ii., April-September, 1890; "Journal of Bombay Natural History Society," vi., part 1; "Transactions of Royal Society, South Australia," xiv., 1; "Journal of Pharmacy," for July, 1891.

#### ELECTION OF MEMBERS.

The usual ballot for new members then took place, the following gentlemen being elected :—Messrs. J. H. Craig, jun., B. Eugène, F. Gladish, H. A. Lamble, F. Marsh, J. Mitchell, and N. T. Wilsmore, B.Sc.

#### NATURAL HISTORY NOTES.

Dr. A. Dendy, F.L.S., read a very interesting note on the "Mode of Reproduction of *Peripatus Leuckartii*." Last May Dr. Dendy obtained three specimens of this species from Macedon, and kept them, in company with one from another district, in a small vivarium, and at the end of July some 12 or 15 eggs were laid. These eggs were easily seen, being fairly large, oval in shape, and covered with a tough, thick, elastic membrane. Microscopic examination of one of them showed that the membrane enclosed a thick, milky fluid, full of yolk granules, the enclosing case being exquisitely sculptured in a regular design. This sculpturing is characteristic of many insect eggs, which renders it especially interesting as bearing upon the relationship of *Peripatus*. This discovery is of importance, as in all other species whose life history is known, the viviparous habit—where the young are born alive—is one of the most remarkable characters of the genus. Judging from the experience of Mr. Fletcher, of Sydney, the eggs may be expected to hatch out some time in October. Mr. Fletcher obtained specimens of this species some three years ago, and kept a female from June to October in damp moss and leaves. Just before its death four young ones appeared, and he naturally concluded that they had been born alive. It is extremely probable, however, that eggs were laid, and that they escaped notice owing to the nature of the material in which they were deposited.

#### PRACTICAL WORK WITH THE MICROSCOPE.

An innovation, in place of the usual reading of papers, was introduced in the shape of some practical work with the microscope. Professor Spencer introduced this work by an address

on the construction and use of the microscope, after which the mounting and examination of dry specimens (Polyzoa) was demonstrated by Lieut.-Colonel Goldstein and Mr. J. Gabriel; the examination of fresh tissue was explained by Mr. J. S. Hart, M.A., B.Sc., and Rev. W. Fielder; whilst Dr. A. Dendy, Mr. T. Steel, F.C.S., and Mr. J. Shephard demonstrated the mounting and examination of specimens in balsam. Great interest was evinced in the various processes by those present, and it is proposed to hold similar meetings from time to time.

#### EXHIBITION OF SPECIMENS.

The usual exhibition of specimens took place, the following being a list:—By Mr. F. G. A. Barnard.—An orchid (*Pterostylis nutans*), grown by himself. By Mr. J. E. Dixon.—Flowers of *Acacia baileyana*, grown by himself. By Mr. C. French.—Jarrah timber, eaten by white ants, from Northern Territory, South Australia. By Mr. C. French, jun.—Eggs of Australian Bittern, from Queensland; Boobook Owl, from Wimmera; and Winking Owl, from Wimmera. By Mr. J. Gillespie.—Specimen of *Ibacus peronii*. By Mr. G. Keartland.—White-lipped Snake, from King Island.

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#### A TRIP TO SASSAFRAS GULLY.

By R. S. SUGARS.

(Read before the Field Naturalists' Club of Victoria, 13th April, 1891.)

FREED once more for a few days from the "daily round, the common task," the interesting question confronts us, "What shall we do with our Easter holidays?" Commencing as they do on Good Friday, two members of the Club consult each other with the view of spending them in a manner which, if it could not be called good, would at least be fairly safe from being described as bad. Acting on the information obtained from a note read before the Club on the 9th March, it was decided to pay a visit to what was soon discovered to be the beautiful spot called Sassafras Gully.

Departing somewhat from the usual custom of starting from the beginning, we are compelled to commence our paper a little way on in the journey, for on reaching Auburn one-half the party is found to be comfortably seated in the train timed to leave Prince's Bridge at 7.20 a.m., and which reached the former station punctually at tabled time (7.38 a.m.) A seat is found for the other half of the party, which now being complete, we feel satisfied that for so far all has gone well. Shortly after passing Camberwell we cross over the newly formed Outer Circle railway, running from Oakleigh to join the Heidelberg line

near Fairfield Park, a piece of line which is likely to be made good use of in the near future. Canterbury is soon reached, but we see no resemblance to the famous cathedral town of old England. Passing through Surrey Hills we reach Box Hill, and here we are told we must transfer ourselves and our weapons to the platform. Of course a journey of 18 miles could not be performed in one train ; we must try another, though we are obliged to confess we did not feel a bit more comfortable for the change. Leaving Box Hill we get into what might be called the potteries of Victoria, for little else is to be seen but brick and tile factories, and the like, until Ringwood is reached. Here we leave the Lilydale line and turn off to the right on to the Ferntree Gully line, and our next stopping place proves to be at our terminus, Bayswater station. Arriving here we discover our carriage door to be carefully locked, the guard probably not liking the look of us, so we are obliged to sit and see the only coach, by which we had contemplated a ride of some three miles on our journey, quickly crowded. Why our particular carriage should have been locked and all the rest left open still remains a mystery to us ; but so it was, and though we started with very good intentions of bearing in mind the sacred character of the day, we fear our thoughts at this particular time were not of a very pious order.

At last we were permitted to alight on the platform, and the railway officials still perhaps thinking there was something uncanny about us, did not ask for tickets. We feel compelled to own that the "get up" of one of the party somewhat tended to lead to suspicion as to his mental stability, for it is not often, we think, that a fisherman, equipped with fishing basket, &c., goes a-fishing with a camera tripod.

We have spoken previously of our weapons, and perhaps it would be as well here to explain the nature of them. They consisted of nothing more murderous than two cameras, with the necessary etceteras, and the game of which we were in pursuit consisting of shadows, perhaps after all the railway officials have a keener perception than we gave them credit for.

Well, the coach was already overloaded, and before we had time to ask many questions we were left alone on the platform. There was no help for it ; walk it we must, and off we started. Striking out on the road leading in the direction of the gully, we reached the coach terminus, distant about three miles or so, almost as soon as the coach itself, heavily loaded though we were. Here a short halt was made, and lightening ourselves of some of our baggage, we decided to leave it at a house near by, and call for it on our return. The owner of the house being a fruit grower, we purchased some of his produce, which proved very enjoyable.

Starting again, we faced a piece of very nice hilly road, which, after our three miles or so already covered in a hot north wind, very soon tried our physical condition. It was climbed, however, and on reaching the summit we began to calculate our position, ultimately finding that, like the King of Spain, we had marched up the hill and had to march down again, though in a more northerly direction, till we reached a very picturesquely situated residence, known as "Hazelglen." The occupier, by name Christian Hunnerup, kindly pointed out the track leading to the gully, and another climb commenced.

However, we were bent on seeing the gully; but we saw a host of March Flies first, and they were evidently glad to see us, for they made themselves very intimate at once. We would have preferred a little less of their attention. Climbing the mountain by a winding track, we are soon in the midst of delightful scenery, the ground being thickly covered with Bracken Fern, Native Hazel, and the usual attendant scrub, out of which rise numerous Tree Ferns (*Alsophila australis*), principally at the gully head. The removal of a number of charred and blackened tree stems, monuments of that dreadful scourge, the bush fire, seems all that is needed to complete a piece of magnificent mountain scenery. At last we reach the entrance to the gully, and down we rush into the cool shade of the multitudinous Tree Ferns (*Dicksonia antarctica*). As the name indicates, the Sassafras tree grows in rich profusion, which, with its dark green foliage intermingled with the luxuriant growth of ferns, forms a shade that even the dreaded hot north wind, out of which we have escaped, does not seem to be able to penetrate. Soon the Sassafras by its pleasant odour makes its presence known if we otherwise neglect to observe it. At the bottom of the gully a cool, sparkling, crystal-like stream ripples gaily amongst the fern roots, at which we are glad to abate our thirst. Under such conditions it is needless to say we enjoyed our first repast at noon. After about half an hour's rest we start off on the track through the gully, so thoughtfully made by Mr. G. S. Perrin, F.L.S., the Conservator of Forests. So well is this track defined that no ordinary visitor could possibly lose his way. Noting as we proceed the beauty-spots—if one part could be called more beautiful than another—we push on until we reach the spot where the track terminates, distant from the entrance to the gully about two miles. *En route* through the gully ever and anon we are confronted by trees of stupendous height, and one of the party, who has never before seen anything to equal them, stands transfixed for the moment before one of these monarchs of the forest. It makes us feel very small indeed when we try to discover the top of them. Looking at one which seems even taller than the rest, a bunch of Mistletoe is observed suspended from the tip of one of its topmost branches, the very picture of isolation. Here

a rustling, cracking noise is heard in the scrub, and, on our endeavouring to ascertain the cause, a good-sized wallaby is seen. He peers through the dense scrub at us for a moment or two, and then, either not caring for our company or having some conscientious scruples as to sitting for his portrait—though we make no charge—he quickly bounds over a fallen log, and is soon lost to view. Reaching the end of the track, and finding it undesirable to break new ground, we decide on retracing our steps, and our cameras are now unpacked, and we set to work—hard work it proves to be—to select the most typical spots in the gully. Climbing over fallen logs and scrambling through meshes of the wire grass, planting our cameras where we can to obtain the choicest views, we pass the afternoon, until, returning to the head of the gully, we find the light has now gone so far as to render further success, for this day at least, impossible; so we returned to "Hazelglen," after a very enjoyable day's work. As we have resolved to accept the offer of a "shake down" for the night from Mrs. Hunnerup, we return for the portions of our baggage which was left on the road, getting back about 7.30 p.m., to find ourselves in a dilemma—how to replenish our dark slides.

Not having brought a dark, or rather safe, lamp with us, it is useless expecting to find one up it in the mountain. After some search a cart lamp is discovered in the cart shed containing a piece of candle, and inquiry is set on foot for a piece of red cloth of some description. All that can be procured is a piece of old bleached flannel, which may have been red at some time—perhaps the only piece within five miles. Tying this over one pane of the lamp we darken up the others and proceed to our bedroom to operate. We managed after a fashion, but we fear we are unable to patent the invention. If one of our party never enjoyed a good night's sleep before, he deprived himself of the opportunity of ever making the complaint in the future, for we verily believe the cry of fire would not have called him from his slumbers.

Next morning after partaking of a hearty breakfast we started afresh, and again reaching the end of Mr. Perrin's track, we decide on exploring a bit on our own account. Following the stream most affectionately for about one hour, during which we suppose we travelled about one mile, we reach the junction of Sassafras Creek with a creek flowing in from the north, which it has been suggested should be called Perrin Creek (as it is unnamed in the government maps) after our indefatigable Conservator of Forests. At this junction it is the intention of Mr. Perrin to erect a hut for the benefit of tourists and ladies. Here a halt was made and lunch partaken of, and, as on the previous day, the cameras are set up and work commenced. A little below this point the fisherman's basket, before alluded to,

was turned to account ; one of the party, with a fern frond stripped of its foliage for a fishing rod, discovering an empty bait tin and beer bottle in the locality, immortalized himself as a disciple of Izaak Walton. As the English Trout are now thoroughly acclimatized in the upper waters of the Yarra, there are indications of Sassafras being a good trout stream, as it is an affluent of the Yarra. Retracing our steps we reach the terminus of the previous day, and again have a search for the monarch of the forest known as "The Baron," about which so much ado was made in the papers last year, but were unsuccessful.

Returning once more to the head of the gully we discover it is time to return to "Hazelglen" and get ready for coming home, and our desire to do so is intensified by the ominous signs of approaching rain, which before we reach the house comes down pretty freely. We are a little disappointed, as we had reserved one or two good views for the last, and owing to the rain were compelled to return without them.

After one or two long pulls at a jug of fresh milk we feel prepared for the journey home. Half an hour's walk or so brings us to the coach terminus at Forest Road, at the base of the ranges. We are fortunate enough this time to secure seats and reaching Bayswater station in time to catch the train leaving at 5.51 p.m., we return to town feeling satisfied that we have had a thoroughly pleasant trip, and bent on once more in the near future paying a visit to Sassafras Gully. We are also in the hope that this short account may prove an incentive to other members to properly work the gully out.

It may be mentioned that although bird life is scarce it was not entirely absent. We saw and heard Lyre Birds, and Black Cockatoos were present in the taller trees with their wailing cries, and among the messmates Gang Gangs were uttering their peculiar, harsh note, while in the gully a few pleasant songsters were heard.

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#### NECTAR OF FLOWERS.

*To the Editor of the Victorian Naturalist.*

SIR,—I am engaged in some investigations on the composition of the Nectar of Flowers, and would be pleased to hear from botanists or others able to supply me with material in the form of carefully selected blossoms during the coming season.

Native flowers are specially wanted.

THOMAS STEEL.

Sugar Works, Yarraville.

## THE BREEDING HAUNTS OF WHITE IBIS.

By A. J. CAMPBELL, F.L.S.

(Read before the Field Naturalists' Club of Victoria, 13th April, 1891.)

EXCEPT two eggs I had the honour of describing before the Field Naturalists' Club, nothing has been recorded regarding the nidification of the White Ibis (*Threskiornis strictipennis*, Gould), the Australian representative of the Sacred Ibis (*Ibis religiosa*), which was so greatly venerated by the ancient Egyptians, therefore I here venture to give a slight sketch of an evening's instructive entertainment I enjoyed in company with a friend when I visited a "rookery" or nursery of White Ibises on the Lower Murray last December.

It has been a summer day in earnest. My friend and I decide to proceed to the home of the Ibises immediately after tea, in the cool of the evening. Reaching the other side of the river we haul our "flatty" or dingy over a narrow strip of land into the swamp beyond. Merrily we pole our tiny boat over the clear mirror-like surface of the lagoon, which is so perfectly transparent that beautiful forms of aquatic weeds are readily distinguished growing below. Lilies with orbicular leaves float upon the tranquil face of the water, and other flowering plants, notably the botanically so-called *Limnanthemum*, with feathery fringed yellow flowers of sparkling star-like appearance. This placid sheet of water appears hundreds of acres in extent, broken here and there with dark-green rushes, in contrast with the seared and sunburnt rises of the further shore.

We steer for slightly shoaling ground literally crowded with game and other waterfowl. Soon the scene changes. Black Swans belabour the water's surface with white-pinioned wings. Black Ducks, Shovellers and Teal rise with quacking notes and whirr of wings, and Stilt Plovers with puppy-like bark. How interesting to watch the various flocks wheeling past! Now again swiftly repassing, but at a safer distance, then they disperse in detachments, while Pacific Herons, with leisurely flight, and a flock of about a score of Nankeen Herons, are likewise on the wing, and surmounting all are companies of Straw-necked Ibis gracefully circling so high that the roseate hue from the western sky behind the deep-coloured fringe of gum-trees is beautifully reflected upon the snow-white breasts of the birds.

We pole to deeper water in the centre of the swamp, towards a large growth of bulrushes. Approaching these another wonderful revelation confronts us. The whole place is croaking and alive with Ibises of two species—the Straw-necked and the White. The dark-coated Straw-necked Ibis rise first, in companies of about half hundreds, and clear off; the white species, evidently nesting,

is reluctant to follow suit. But they are compelled to clear too when we shoot the nose of our boat into the rushes amongst their crowded nests. There is no error about our situation, judging from the pronounced ammoniacal smell that arrests our senses. However, the nests are picturesquely grouped on irregular steps or terraces formed by the tops of the rushes being split or frayed out, then matted together into platforms to within a few inches of the water. A shallow hollow in the compounded rushes suffices for a nest, which is further augmented by flags, grasses, and, in some instances, eucalypt branchlets. The nests measure 12 to 18 inches across and contain clutches of somewhat granulated whitish coloured eggs. Hastily looking at those nearest us we see a nest with 5, another with 4, four with 3 each, and another with 7 (probably two clutches, judging by the stale, dirty appearance of some of the eggs). A proper complement is evidently 4 eggs, a typical set, measuring in inches—(1)  $2\frac{1}{2} \times 1\frac{2}{3}$ , (2)  $2\frac{7}{12} \times 1\frac{3}{4}$ , (3)  $2\frac{7}{12} \times 1\frac{3}{4}$ , and (4)  $2\frac{1}{2} \times 1\frac{2}{3}$ .

Out of the scores of nests only a few are occupied by young—helpless, not many days old, with heads black and the pinkish skin of the rest of their bodies showing strongly through a moderate coating of white down.

The water here is about 4 or 5 feet deep, the patch of rushes being about half an acre in extent. The birds have trampled down the north and west margins for their rookery, leaving the greater portion of the tall rushes standing, which appear to afford an excellent protection as a breakwind.

Darkness now creeps over the water, and mosquitoes become very insinuating. Coots defiantly screech at us from out the reeds, but the sweet alarm notes of a flock of passing Plovers, the trumpeting of Cranes or Native Companions in the distance, together with the booming bass of Bitterns at various points of the vast swamp, are charming music in our ears. Carefully now we move, and peering through the gloom, steer for the higher end of the swamp, where fortunately we easily strike the river and swiftly glide down with the running current of a broad stream for about a mile towards home. In the darkness, dark dumb regiments of red-gum trees silently pass, which exceedingly magnify the breadth of the river, especially in the gloomier bends and corners.

Home safely reached terminates the exploits of an extraordinary evening.

[NOTE.—Since writing the above I have received from Mr. A. J. North, F.L.S., the "Records of the Australian Museum" for March, wherein he redescribes the eggs of the White Ibis, and also embodies a very interesting account of a visit by Mr. K. H. Bennet to an Ibis rookery situated near the Lachlan River, New South Wales.]

## THE DESTRUCTION OF EUCALYPTS.

By REV. W. WOOLLS, D.D.

(Read before the Field Naturalists' Club of Victoria, 13th April, 1891.)

No genus of plants in the colony of New South Wales has suffered more extensively from the hand of man, and from natural causes, than that of Eucalyptus. When the first settlers landed at Port Jackson, one of their principal objects was to destroy the forests by which they were surrounded. This, indeed, was to a certain extent necessary for the purposes of building, cultivation, fencing, and firing, but it appears that gangs of men were employed to clear all before them, and that, under the fear of punishment, they had a certain amount of task work to perform in that direction. Where Sydney now stands, some of the trees, such as the Iron-barks (*Eucalyptus siderophloia*, Benth., and *E. paniculata*, Sm.), Swamp and Red Mahogany (*E. robusta*, Sm., and *E. resinifera*, Sm.), and the gums of different kinds, were of large dimensions, and therefore the labour of clearing must have been one of difficulty. The giants of the primeval forest, however, gradually disappeared, and as grants of land were given to the early settlers, or those who had obtained their freedom in the colony, the process of destruction was carried further inland. For the purposes already indicated, it was necessary that many trees should perish, but, in the early days of the colony it seemed to be the policy of the settlers to clear off all the trees irrespective of their industrial value or even their usefulness for fencing and fire-wood. Hence many of the so-called farms were completely denuded of their timber. No trees were left to shelter the cattle from the summer sun, or to preserve wood for domestic purposes. From Port Jackson to the Blue Mountains this system was pursued to a greater or less extent, so that of late years there has been a difficulty in procuring, near at hand, the best of Iron-bark for railway purposes, piles, &c. Indeed, were it not for the fact that some of the large landed proprietors have kept their forests unmolested, or have thinned out their trees by selecting only those that were fit for industrial purposes, several species of Eucalypts must have perished long since. Great, however, as the destruction has been from the indiscriminate clearing of the land, much greater has arisen from the process known as "ringbarking." Some years since, when from the expense of labour and the desire of carrying on the work more speedily, this system was devised, the destruction was increased a hundredfold, and was extended far beyond the settled districts. The object sought for was the growth and improvement of the native grasses, whereby instead of perpetuating a so-termed useless generation of Eucalypts, a luxuriant vegetation might be secured for the sustenance of

sheep and cattle. In some districts, this has no doubt been the case, and the runs have been able to support an increased number of stock ; but evils have also arisen from destroying not merely shrubby species of no great utility, but trees of commercial value. I myself have seen numbers of Iron-barks (*E. crebra*, F. v. M., and *E. paniculata*, Sm.) sacrificed for grazing purposes. Now, these trees, as indeed all the species of *Eucalyptus*, are not merely calculated to promote the health of the community by diffusing far and wide gases conducive to the physical benefit of man, but as years roll on they are becoming of greater consideration. Opinions are somewhat divided on the subject of ring-barking, for whilst most people agree as to the policy of removing such as may be deemed cumberers of the ground, men of judgment lament over the loss of useful species, or the contingency that a host of troublesome weeds may spring up where eucalypts once flourished. The late Mr. Thomas Shepherd, who had devoted many years to the study of this question, was of opinion that the rainfall is affected in a greater or less degree by the increase or decrease of forest vegetation, and not only that, but he maintained that the shelter of trees is necessary for the preservation of the more delicate grasses. Whether ringbarking is right or wrong, it is certain that the system has been carried on relentlessly, and that the sanction of the Government, by allowing so much an acre for land which had been ringbarked, accelerated the work of destruction. It is satisfactory, however, to know that the system has been much modified, and that great care is now taken to foster the Government reserves, and to keep the best of the eucalypts from annihilation.

Floods have sometimes proved very injurious to eucalypts. Some species are capable of living longer in flooded areas than others ; but even the River Gum (*E. rostrata*, Sch.), which generally grows on the side of rivers or in moist low grounds, cannot endure any prolonged inundation. Sir Thomas Mitchell mentions that he had noticed saplings of this species (which had probably been growing in the bed of a dried-up creek for eight or ten years) killed by some overwhelming flood (vol. ii., p. 148). He also observes, in reference to the destruction of gum trees near Regent's Lake—"On its northern margin, and a good way within the former boundary of the lake, stood dead trees of a full-grown size, which had been apparently killed by too much water, plainly showing, like the trees similarly situated in Lake George and Lake Bathurst, to what long periods the extremes of drought and moisture have extended, and may again extend in this singular country" (vol. ii., p. 34). Our eminent astronomer and meteorologist, Mr. Russell, has devoted much time to the history of Lake George, and has shown that, during periods of drought (as appeared from the statement of the blacks and also

from observations extending from the time of its discovery, in 1820, to the present day), the lake has been covered to a greater or less extent with trees. As the water rose again, they were killed ; and such has been the case with the eucalypts lining the banks of our rivers, or growing in low lands adjacent to them. A remarkable instance of the kind occurred some years since at Menangle, on the Cowpasture River, where, after long continued rains, all the eucalypts died over an extensive area ; and, in some of the large floods of the Hawkesbury, instances have occurred in which from 50 to 100 acres of land, with the trees on it, have been carried away by the violence of the torrent.

Trees are not unfrequently struck by lightning and killed, and I have known cases in which hailstorms have passed over the mountains, and in their course have stripped the trees of their leaves for a considerable distance. For a time the forest had the appearance of bare poles, but in a season or two it regained its accustomed verdure.

Droughts and bush fires are sometimes very fatal to eucalypts, but probably not so much so as floods, for many species of them can stand a vast amount of heat, or even if scorched by the fire they display wonderful recuperative energy. In the great drought of 1798, early writers record that the bush from Sydney to Parramatta was completely on fire, the trees being burned to their tops ; and Captain Sturt (in 1829) tells us that in the western interior the largest forest trees were drooping, and many dead. Great havoc occurred also during the drought of 1851 (remembered in Victoria as "Black Thursday"), and again in 1870 and 1875 ; whilst in 1888, which, according to Mr. Russell, was the driest year on record for fifteen years, the bush suffered in many parts from similar causes. Notwithstanding the devastation committed in dry seasons, some of the eucalypts have astonishing powers of endurance. Amongst these, Mr. J. E. Brown, F.L.S., conservator of our forests, instances the Sugar Gum (*E. corynocalyx*, F. v. M.) as possessing uncommon vitality, even in the driest seasons, when other trees die. He has recommended it therefore for cultivation in the arid parts of the west. It is really marvellous that there should be any vegetation at all in some parts of Australia, when the heat is so intense. Sturt reported that on two occasions the heat exceeded  $130^{\circ}$  in the shade, and approached  $160^{\circ}$  in the sun ; whilst water evaporated in the creeks at the rate of an inch per day. Again, only last year, Mr. W. H. Tietkens stated, in his journal, published by the Government of South Australia, that during his exploring expedition into Central Australia, especially from the Finke to the Bond Springs, "the weather was extremely hot, the thermometer for several days recorded  $172^{\circ}$  in the sun, and upon

one occasion 178°." Such heat seems almost incredible, nor can we be surprised that, in pursuing his journey, he found the vegetation stunted, the eucalypts (such as Bloodwood, Gum, and Mallee) being small, until he came to the Macdonnell Ranges, when he found White Gum trees three feet in diameter. Amongst his specimens Baron Mueller recognized *E. setosa* (Schauer), *E. gamophylla* (F. v. M.), and a species not determined. The two former, as already described by Baron Mueller, are well defined, but small trees, and they serve to show that, even under circumstances of difficulty, *Eucalyptus* can hold its own.

Various species of the genus have suffered from the ravages of insects and opossums, and, in the opinion of the late Sir W. Macarthur, from fungi generated in wet and unhealthy seasons. Baron Mueller in his "Eucalyptographia," has referred several times to this subject. Alluding to the common Forest Gum (*E. tereticornis*, Sm.), and the River Gum (*E. rostrata*, Sch.), he observes that these gums, and perhaps some other species, become sometimes destroyed over extensive areas by a phasmaticidous insect, which, when occasionally developing in vast numbers, devours the foliage of these trees so completely as to cause them to die off. Sir W. Macleay, of the Linnean Society of New South Wales, referred ("Transactions," 1881) this insect to *Podocanthus*, and described the destructive creature as *P. wilkinsoni*, it having been brought first under scientific knowledge by C. S. Wilkinson, the Government Geologist of New South Wales. Mr. Wilkinson, in a letter to the Baron, confirmed this statement, whilst Mr. A. W. Howitt found that in Gippsland the same trees were destroyed by an arctiidous moth, which, in the opinion of Sir W. Macleay, is allied to *Orgyria*. As *E. tereticornis* is one of the most widely distributed species on the eastern coast, ranging from Gippsland to the Gilbert and Burdekin Rivers, and as *E. rostrata* occurs along river banks beyond the Dividing Range in New South Wales, and in similar situations throughout nearly the whole of Australia, these species have been found more frequently than others in an unhealthy or dying state from the ravages of insects. *E. buprestium* (F. v. M.), however, of Western Australia is much infested by beetles, especially that called *Buprestis* (from which, indeed, it takes its specific name), but, according to Mr. Otto Tepper, neither buprestidæ, nor the gigantic and beautiful *Stigmodera* beetle (four species of which take possession of *E. uncinata*, Turcz.), attack the leaves, but resort to the flowers to imbibe their nectar. *E. odorata* (Behr.), which Baron Mueller states occurs along towards Spencer and St. Vincent Gulfs, and thence to the Flinders Ranges, ascending Mount Brown to 2,000 feet elevation, is said to suffer very much from a nocturnal Melo-

lontha Cockchafer, which preys on the foliage and ultimately destroys the trees. As another cause of the destruction to eucalypts, the Baron alludes "to the local increase of *Phalangistæ* (opossums, &c.), after the gradual disappearance of the aboriginal hunters." These, feeding on the leaves, are supposed to be as injurious to the trees as the insects already mentioned, though in the settled districts this is not noticed, as so many opossums fall victims to Australian sportsmen. In Western Australia, *E. cornuta* (Lab.) is a favourite with these marsupials, as they get fat on the somewhat melluginous flower. Sir Thomas Mitchell ("Tropical Australia," p. 127) alludes to a remarkable whiteness found on *E. populifolia* (Hook.), which is said to be an extremely beautiful production formed by some insect of the *Coccus* kind.\* Something similar has been found on other eucalypts, and no doubt indicates an unhealthy condition of the trees.

There can be no doubt that in some parts of Australia eucalypts are rapidly diminishing. In the settled districts it is easy to account for their disappearance by the progress of cultivation, the frequency of ringbarking, the destruction of seedlings by cattle, and the planting of exotics. All these causes are in operation, whilst in all probability the consumption of wood for fuel and industrial purposes exceeds the natural growth of timber in the forests. New South Wales has been very extravagant in the use of her eucalypts, and it is only by making forest reserves, by raising seedlings in nurseries for transplanting, and by preventing the wanton destruction of large and valuable trees, that compensation can be made for past folly. Even now the want of good timber is felt in some of the colonies, and large sums of money are sent out of the country for the importation of that article, and were it not for the great consumption of coals and gas for domestic purposes it would be difficult to supply the large towns with firewood. With regard to floods and drought and other visitations of nature man has but little control, but in the progress of science superfluous waters may be carried off to some extent by artificial channels, and arid lands may be improved by irrigation for the purpose of tree-planting. If opossums are really as injurious to eucalypts as some represent, means may be adopted to treat them as native dogs and kangaroos have been treated, so that their numbers may be diminished in districts where their presence is regarded as detrimental. As eucalypts are most valuable trees, whether considered in an industrial, medicinal, or hygienic point of view, it is highly important to

\*Some of the forests on the high land to the south are supposed to have perished from some kind of *Coccus*, but the late W. S. Macleay, F.L.S., the great entomologist, was of opinion that insects were rather the *effect* than the *cause* of disease, and that the trees were in an unhealthy state before the insects began to increase.

prevent their indiscriminate removal. They furnish, and by judicious management they may continue to furnish, some of the strongest and most durable of timber. They afford in their resins, their barks, and their volatile oils many substances useful for economic and therapeutic purposes, whilst it is a fact that those who live in the country and inhale the gases emanating from their leaves can bear testimony to their sanitary properties. Nor should it be forgotten that such are their powers of absorption in relieving unhealthy districts of malaria and stagnant waters that their influence has been acknowledged in the Old as well as the New World.

BURWOOD, 30th March, 1891.

NOTE.—In justice to Baron Mueller, I should state that he refers to the ravages of the opossums principally on the testimony of others, and that they are mentioned only incidentally in connection with other causes of destruction. I may add, however, that when this question was discussed some time since one of the members, in the *Sydney Morning Herald*, gave several reasons for believing that the opossums in his district caused much destruction to the Eucalypts.—W. W.

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#### HENRY EDWARDS.

WE regret to have to record the death of Mr. Henry Edwards, the distinguished actor, who was a member of the Field Naturalists' Club of Victoria. Mr. Edwards had achieved a high reputation in his profession, both in Australia and in the United States. He was born in 1824, at Ross, in Monmouthshire, England. He came to Victoria early in the fifties, and soon became well known in Melbourne in association with Mr. G. V. Brooke. He devoted his leisure time to entomology, and was one of the very first to study our Victorian Lepidoptera. Proceeding to America in 1867, he continued his favourite study, and during the last thirty-five years of his life had formed one of the largest private collections of insects in the United States. Between 1886 and 1889 he devoted the whole of his leisure time to compiling a bibliographical catalogue of the described transformations of the North American Lepidoptera, including about a thousand species. This was published by the Smithsonian Institute at Washington, and is a monument of scientific enthusiasm and patient and laborious research. He paid a second visit to Melbourne in 1889, and was present at some of the meetings of the Club. He made further observations on the transformations of Victorian Lepidoptera, and published descriptions of certain of these in this journal. Mr. Edwards was an eminently lovable man, and his loss is deeply felt by a large circle of private friends in Melbourne, as well as by the general public, who were delighted by his representations.

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C. A. TOPP, M.A., LL.B., F.L.S.

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VOL. VIII.—No. 6.

OCTOBER, 1891.

# The Victorian Naturalist:

THE JOURNAL AND MAGAZINE

— OF —

The Field Naturalists' Club of Victoria.

PUBLISHED OCT. 7, 1891.

Editor: A. H. S. LUCAS, M.A., B.Sc.

The Author of each article is responsible for the facts and opinions he records.

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VOL. VIII.—No. 6. OCTOBER, 1891.

No. 94.

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FIELD NATURALISTS' CLUB OF VICTORIA.

THE monthly meeting of the Field Naturalists' Club was held in the Royal Society's Hall on Monday evening, 14th September. Mr. D. Best occupied the chair, and there were some 80 members and friends present.

LIBRARIAN'S REPORT.

The hon. librarian presented his report of additions to the library, which included a donation of 13 volumes from Mr. J. Smith, of Albert Park, for which a special vote of thanks was recorded. The following is a complete list of books received :—“Iconography of Salsolaceous Plants of Australia,” decade vii., by Baron von Mueller, from Government; “Proceedings Linnean Society of New South Wales” (second series), vol. vi., part 1, from Society; *Geelong Naturalist*, i., 1, July, 1891, from Gordon College F. N. and S. Association, Geelong; “Nidification of *Edoliisoma tenuirostris*” (reprint), by A. J. North, F.L.S., from author; “Journal of Pharmacy,” August, 1891; 13 volumes from Mr. Jas. Smith, being Hooker’s “Synopsis Filicum”; Morris’s “History of British Butterflies”; Hopley, “Snakes”; Nichols, “Zoological Notes”; Badcock, “Vignettes from Invisible Life”; Wilson, “British Farming”; Syme, “Modification of Organisms.” Natural History Rambles Series: — “Woodlands,” Dr. Cooke; “Rivers and Lakes,” C. O. G. Napier; “Lane and Field,” Rev. J. G. Wood; “In Search of Minerals,” D. T. Ansted; “Mountain and Moor,” Dr. J. E. Taylor; and “Underground,” Dr. J. E. Taylor.

ELECTION OF MEMBERS.

The ballot for new members then took place, the following gentlemen being unanimously elected:—Messrs. L. J. Balfour, A. D. Denny, J. P. Fiddian, B.A., A. E. Hill, F. A. Officer, and J. J. Porter, and ten others were nominated for election at the next meeting.

REPORTS OF RECENT EXCURSIONS.

The new programme of excursions was opened by an outing to the heath country lying between Brighton and Sandringham, on 15th August, under the leadership of Mr. J. Shephard, who had undertaken to initiate members into the art of capturing the deni-

zens of the pools and swamps in that locality. About 20 members answered his summons, and some good finds were recorded, amongst which may be mentioned *Volvox globator*, two or three species of Entomostraca, and no less than eight species of Rotifera. Mr. C. French, jun., who headed the botanical section, reported nine varieties of orchids in bloom.

The gathering at the Government Entomological Department at the Exhibition Buildings on 29th August was a great success, more than 20 members and friends being present. Mr. C. French, F.L.S., Government Entomologist, personally conducted the party, and pointed out the most prominent objects of interest. Perhaps the most interesting and instructive of all the specimens there are those which represent the life-histories of our insect pests. They are systematically arranged to show at a glance not only the successive stages in the growth of the "beasts," but also to give some idea of their habitat and the nature of their ravages. Mr. French has also initiated what will eventually be a leading feature in his department, namely, the mounting of dissected insects on cards to show clearly the external anatomy. It is proposed to furnish the State schools with different sets of these cards for teaching purposes. The Algerian system of dealing with the locust pest was explained by Mr. French, who also exhibited the screens used in connection with that system. A very pleasant afternoon was brought to a close by a visit to the economic collection, a large portion of the exhibits here being supplied by Baron von Mueller.

The botanical excursion to Cheltenham, under the leadership of Mr. J. S. Hart, M.A., B.Sc., took place on 5th September, and was patronized by about a dozen members, some of whom, however, were bent on ornithological researches. Nothing new or of special importance was added to collections, but all enjoyed the fresh air and free intercourse which are the usual attendants of such outings as these.

#### PAPERS.

The first paper was read by Mr. C. G. W. Officer, on "The Supposed Human Footprints on Æolian Rocks at Warrnambool." In introducing the subject, Mr. Officer described in detail the formation and nature of the sand dunes and their connection with the underlying strata, as shown by the similarity of the stone now being quarried there. From an analysis of the stone made by Mr. Avery, of Queen's College, it appears that it contains about 94 per cent. of carbonate of lime. Last December a slab was discovered in one of the quarries bearing impressions which suggested that they were made by human beings. This slab was secured by Mr. Archibald, and placed in the Warrnambool Museum. The determination of the age of the rocks is of importance, and from the evidence of subsidence and elevation

which has probably taken place since the impressions were made, Mr. Officer is of opinion that a considerable lapse of time has occurred since the rocks were laid down, and he suggests that the impressions were made by two individuals sitting close together and somewhat obliquely to each other.

In the discussion which followed, Mr. D. M'Alpine, F.C.S., spoke in complimentary terms of the paper, and referred to the action of carbonate of lime in the preservation of such marks, whilst Mr. F. R. Godfrey, who had seen the slab, bore testimony to the remarkable similarity of the impression to human footprints.

Mr. J. Dennant, F.G.S., F.C.S., remarked that as his authority had been quoted for the recent age of the *Æolian* rocks, he would state the argument for that view. The newer basalt, which underlies these rocks at Portland and elsewhere, must itself be a comparatively modern deposit, for it is younger than the late pliocene beds at Limestone Creek, about 25 miles inland from the Glenelg mouth. Unlike igneous or unfossiliferous sedimentary strata, there can be no doubt about the age of the Limestone Creek beds, as they have yielded nearly 250 species of marine shells, 81 per cent. of which are still living in our seas. The order of strata then is:—Marine Later Pliocene of Limestone Creek; Newer Basalt of Portland, &c.; and on the top of this the *Æolian* rocks. The basalt, from its superior position with reference to the marine beds, must be classed as pleistocene, and as a consequence the still younger *Æolian* rocks could only have been deposited either at the close of the pleistocene or at the commencement of the recent period. In the absence or extreme paucity of fossils in the last-named deposit, there is insufficient data for deciding between the two alternatives. I incline to regard the rocks as recent, because they are still in course of formation. The very best locality for observing this is amongst the sand dunes of Bridgewater and Discovery Bays, where the material may be seen in every stage, from loose sand to consolidated rock, almost as hard as that used for building purposes at Warrnambool. Tenison Woods studied the *Æolian* rocks of Victoria and South Australia, and described them most graphically in his “Geological Observations in South Australia,” published in 1862, but as he entirely altered his opinions concerning the mode of their formation in his later years, the age assigned to the strata in that work need not be taken into account. No information is to hand as to whether the rock is found on the islands lying between Tasmania and Victoria, and in any future excursion of the Club to these islands the geological members of the party might be asked to note whether it exists, and, if so, its elevation above sea level. Some clue might thus be obtained as to an alleged subsidence of the land since the consolidation of the earlier dunes. The author of

the paper refers to these rocks being sometimes met with out at sea, but the evidence adduced is not sufficiently detailed. My own observations show them to exist in one or two places slightly, though very slightly, below low water mark, but subsidence is not, I think, conclusively proved by these instances, as slight submergence might be caused by local coast action. In reference to the supposed footprints, it is necessary to be very guarded in accepting any but the strongest evidence on such points. Amongst limestone rocks it is well-known that mimetic forms are common. In the *Æolian* rocks of Cape Bridgewater occurs the so-called fossil forest, which the casual observer can hardly be persuaded to believe is an accidental resemblance, and nothing more. At the same time Mr. Officer must be congratulated on having produced an interesting and highly suggestive paper. The rocks are well described, and whether his conclusions concerning the impressions are accepted or not, he has succeeded in drawing renewed attention to one of the most striking formations in Victoria.

Mr. G. Sweet supported the views expressed by Mr. Dennant, and in remarking upon the numerous impressions on rocks, many of them of fantastic shapes, which had come under his own notice, told a good story of an alleged find of a fossil calf—a discovery only to be excelled by the exhuming of a fossil cow. Messrs. F. G. A. Barnard, M. C. Bridger, and F. Wisewould also joined in the discussion.

The second paper was by Mr. T. Steel, F.C.S., on "Maori Preserved Heads of New Zealand." Reference was made to the custom of the Maoris in the reverence they pay to their deceased ancestors, and corresponding customs amongst the natives of Africa, New Guinea, New Hebrides, Egypt, and Australia. The writer then described the method pursued by the Maoris in preserving the heads of distinguished persons, and exhibited a very good specimen in illustration, the age of which could be traced back for at least 50 years. He concluded by stating the fact that before the head came into his possession it had been neglected, and most of the hair had been destroyed by moths. After having kept it some time, he noticed that a thin growth of very fine hair in scattered patches had taken place. In order to gain definite information of future growth, the hair has been closely shaved from a marked patch, and subsequent inspection will reveal the extent and rate of growth should it take place.

Owing to the lateness of the hour at which the paper was concluded, members did not show any disposition to discuss the subject, Mr. D. M'Alpine being the only one to offer a few remarks.

Fijian and Malocollo crania were also exhibited in illustration of the subject.

## EXHIBITION OF SPECIMENS.

The meeting terminated by the usual exhibition of specimens, of which the following is a list:—By Mr. F. G. A. Barnard.—Branch with flowers of *Lhotzkyia genetylloides* (F. v. M.), from plant obtained at the Grampians and grown at Kew. By Mr. C. Duncan.—Four species and two varieties of ferns. By Mr. C. French, jun.—Eggs of Tasmanian Grauculus (Tasmania); Bell Bird and Coach-whip Bird (Gippsland). By Mr. H. Hill.—Cases of New Zealand and Victorian Lepidoptera. By Mr. G. A. Keartland.—Pair of Brush Wattle Birds (*Anellobia mellivora*): eggs of Yellow-legged Spoonbill (*Platyleia flavipes*), Pacific Heron (*Ardea pacifica*), Little Water Crake (*Porzana palustris*), and Painted Snipe (*Rhynchea australis*); also, what are stated to be those of the New Holland Snipe (*Gallinago australis*). By Mr. Jas. Lidgett.—Branch of mangrove tree; also coloured drawings of Victorian and Queensland butterflies and moths, amongst which the following were named:—*Delias harpalyce*, *D. aganippe*, *Terias smilax*, *Papilio sarpedon*, *Agarista glycine*, and *A. lewinii*. By Baron von Mueller.—Plants from Prince Regent's River, North-Western Australia, including two species new to science, viz., *Corchorus allenii* and *Triumphetta bradshawii*; *Dodonaea hansenii*, from Stuart's River, North Queensland, also new to science; also eighth edition of "Select Plants," by Baron von Mueller. By Mr. C. G. W. Officer.—Fragments of bone and specimens of Æolian rocks, from Warrnambool. By Mr. J. Shephard.—Mounted specimens of a rotifer (*Notops clavulatus*); also sliding microtome, with improved paraffin carrier, and a simple microscope (both manufactured by Davies, Shephard and Co., South Melbourne). By Mr. Thos. Steel.—Living specimens of the Whip Snake (*Hoplocephalus flagellum*), from Yarraville, and Copper Snake (*H. superbus*), from Sandringham; and two lizards (*Liolepisma trilineatum* and *Grammatophera muricata*), from Moonee Ponds; also Fijian, Maori, and Malocollo crania (in illustration of paper). By Rev. W. T. Whan.—Fossils from Muddy Creek, Curdie's River, and Gellibrand River.

## EXCURSION TO BRIGHTON BEACH.

ON Saturday, the 15th August, on the arrival of the 1.40 train from Melbourne at Brighton Beach, about twenty members assembled to take part in the first excursion of the new programme. Some four or five elected to proceed to Sandringham by train in order to search the heath lands for botanical specimens. The main body of the party at once started in the direction of Hampton, to go over a locality locally known as Smith's paddock, where there is usually a considerable area of

swampy ground. The first halt was made at a depression filled with storm water, the recent heavy rains having created a miniature lake. Here the first dip revealed the presence of the charming *Volvox globator*, and a little further on in the same swamp the fine free-swimming rotifer, *Notops clavulatus*, was found in great abundance. This rotifer is very widely distributed, and is to be met with at all seasons, but on this occasion it was unusually plentiful, and subsequent examination showed it to be feeding on the young spheres of the *Volvox*, and to this plentiful food supply the great number of the rotifer was no doubt due. Phials of various sizes and shapes were produced, and samples of the water taken for examination at home. Moving on in the direction of Sandringham, one or two pools were tried, one yielding a large supply of the common *Stentor*, *S. polymorphus*, which was in such vigorous growth that on being placed subsequently in a trough a few days sufficed to change a single individual into a group the eighth of an inch in diameter and numbering scores of animals, and the colony in the meantime secreting a gelatinous mass which housed the whole party. Another pool yielded a few specimens of the common leech. Going further towards the high land immediately above Sandringham railway station, duly appreciating the beautiful view obtainable, the party reached a swamp lying in a depression on the somewhat elevated table-land of heath country. Here *Volvox* was again plentiful, and a large water beetle was noticed, the very ferocious-looking larvae of which had been earlier seen. Gatherings were taken from all likely places. A little diversion was created by one of the leeches previously captured escaping, with manifest intentions of making a meal off the person of the Club's secretary. Mr. J. S. Hart and a few members here rejoined the party, after a short detour for botanizing purposes, and reported having made several interesting observations.

As the sun was now fast sinking, a move was made for the railway station, and train taken for Melbourne, after a pleasant afternoon, of which not the least enjoyable factors had been the fresh spring air, blue sky, and pleasant views of sea and land.

Examination of the material, made later, in the brief time I was able to give to it, enabled me to recognize, in addition to the forms previously mentioned :—*Entomostraca*. — *Diopтомus castor*, *Daphnia vetula*, *D. pulex*, *Cyclops quadricornis*. *Rotifera*.—*Anurea aculeata*, *Polyarthra platyptera*, *Notommata naias*, *Diashiza semiaperta*, *Mastigocerca carinata*, *Noteus quadricornis*, *Melicerta ringens*, *Limnias ceratophylli*.

Mr. C. French, jun., reported that the botanical section were very successful, the following orchids being obtained in flower :—*Pterostylis nana*, *P. curta*, *P. mutans*, *P. concinna*, *P. pedunculata*, *P. vittata*, *Corysanthes pruinosa*, *Acianthus exsertus*,

*Cyrtostylis reniformis*; and, in addition, ornithology had not been neglected, as nest, eggs, and young of the New Holland Honey-eater, and nest and eggs of the White-fronted Sericornis, were secured.

J. SHEPHARD.

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### VISIT TO THE ENTOMOLOGICAL DEPARTMENT.

SOME twenty members of the Club visited the Government Entomological Department at the Exhibition Buildings on Saturday afternoon, 29th August, at the invitation of Mr. C. French, F.L.S., the Government Entomologist. It was a typical spring day, and those assembled in the somewhat gloomy buildings had smothered longings for the bright sunshine outside. These impressions, however, lasted only so long as we were waiting for the tour of inspection to begin. Directly the specimen cases were opened the sense of gloom vanished, and the highly coloured butterflies gathered in from every quarter of the globe, together with the sombre but rich tints of the varied forms of beetles, riveted attention, and seemed for the time being a fair exchange for the glorious weather outside. It is impossible to describe in detail the rare and beautiful specimens in this collection, or their marvellous adaptation to the surroundings in which they lived. Let it suffice to state that it includes types of the different groups, genera, and species of butterflies, moths, beetles, &c., not only for purposes of comparison, but also for exchange, and Mr. French will, as we know from experience, give the most courteous attention to enquiries in this, one of his special branches of study and research.

We should, however, be neglecting an obvious duty if we passed over in this hurried manner the cases set apart for illustrating the life-history of our insect pests. Thus the eggs, larval stages, and perfect insects, together with examples of their ravages, are given, so that one can see at a glance not only the various stages in growth and development, but also the particular food and circumstances under which they live. Amongst other pests so treated may be mentioned the Victorian Locust, the Codlin Moth, the Pear Slug, the Cherry Borer, and the Potato Moth.

Mr. French thus sets an example which could be followed with profit by many collectors. He does not simply secure his "beasts," but he arranges them so that they have an educational value, not according to details of colour, but rather from an economic and scientific standpoint. His specimens are not simply so many isolated items in the animal kingdom, but rather so many links in that chain of nature which it is the object of the true naturalist to aid in completing. The study of the life-history of insect pests is, however, not confined to mere dried specimens,

since breeding cages are kept, in which some of the insects are bred, and the various stages, from "youth to manhood," watched and noted with great attention and accuracy. These cages are very simple in construction, being made of wood with a glass front, and perforated zinc sides, and a small door at the back for the purpose of introducing the insect and its food and for removing refuse.

Another cabinet which excited admiration was that devoted to specimens of insect dissection. This represents a new departure in the work of the department, and has been introduced in the interest of the rising generation of naturalists ; and Mr. French is to be congratulated on the manner in which the work has been performed. The dissections represent the external anatomy of each natural order, and in many cases of genera also, the different parts of one insect being gummed on to a stiff card and numbered, a key to the numbers being supplied on a separate slip. The subjects already treated include scorpions, beetles, moths, and wasps. It is proposed to supply different sets of these cards to the State schools for teaching purposes, and as the schools have been already supplied with a "Descriptive Chart of Destructive Insects," also revised by Mr. French, we may confidently expect the ranks of entomologists to be materially strengthened in the future from the benches of our State schools.

Here also is a splendid collection of insectivorous birds, some of which have been exhibited by Mr. French at several of the monthly meetings of the Club in connection with the papers he has read on "The Insectivorous Birds of Victoria."

It is proposed to increase the present collection as much as possible, that it may be of real assistance to the agriculturist and others, the specimens being so arranged, together with their eggs, that anyone may see at a glance the particular birds and eggs it is desirable to protect. This seems to us to be the required complement to the other branch of work in this department—destruction in the case of insect pests and preservation in the case of those birds which will assist in that destruction—and it shows the thoroughness with which the Department is doing its work—a tower "four square to every wind that blows," which is worthy of all commendation.

An extra room has lately been added, which gives accommodation to the nucleus of a library which is in course of formation. It already numbers more than 300 bound volumes, comprising books on practical and scientific entomology, botany, &c., in English, French, German, Italian, and Dutch languages, many of the works being scarce and difficult to obtain. The following is a list of the most important :—"Illustrations of *Lepidoptera Heterocera* in the British Museum" (Buller); "Butterflies of the Malay Peninsula;" "*Libellulinae Europaea*" (Charpentier);

"Orthoptera" (Charpentier); "Forest Insects" (Ratzenburg); "Dutch Expedition to Sumatra—Botany and Zoology;" "Acari, Myriopoda, et Scorpiones" (Berlessii); "Melances Orthopterologiques" (Saussure); "Catalogus Specierum Generis Scolia" (Saussure et Sichel); "Etudes sus les Vespides" (Saussure); "Illustrations of more than 1,000 Species of North-west European Ichneumonidæ, sensu Linnæano." We also had the pleasure of seeing the plates which will be issued in illustration of part ii. of "Destructive Insects of Victoria," the letterpress of which is in active course of preparation, as also the plates of a treatise on locusts, which will very shortly be in the hands of the public.

The whole visit gave the greatest pleasure to all those who took part in it, and the impression left was that the Government is doing a work of immense importance to the economic and commercial life of the colony in the support of such a department as this, and that they have chosen wisely in appointing as Director one who not only possesses the requisite knowledge, but who also brings to bear upon the work skill and energy which must, in the long run, rank the Victorian Entomological Department one of the foremost in Australia.

W. FIELDER.

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#### EXCURSION TO CHELTENHAM.

ABOUT a dozen members took part in an excursion to Cheltenham on 5th September, avowedly for botanical purposes. In fact, two of them left the rest immediately, in order to look for birds' eggs, and have not since been heard of. Three others engaged in a more or less successful search for insects, while the remainder divided their attention between snakes and wild flowers. Of the former, two specimens were obtained; of the latter, a great many, but not of any particular value to the collector. It was hoped that *Hovea heterophylla* would be met with behind the Cheltenham cemetery, and a start was therefore made in that direction; but some never-to-be-sufficiently-excreted clearers had been before us, and had left no signs even of the plants. We therefore went on in a south-west direction, till we came near the beach road, discovering on the way *Polypompholyx tenella*, *Sprengelia incarnata*, and early specimens of most of the common spring orchids of the locality. For these, however, it was a few days too early. A council of war was held under some ti-tree scrub (for a heavy shower had come on), and resulted in a division of the party, half walking on to Sandringham along the coast, and the other half returning by a different route to Cheltenham, and so, in company with the patronizers of Mentone races, to Melbourne.

The two ornithologists who joined our party at Prince's Bridge station accompanied us as far as Cheltenham; but as the inevitable gun formed a part of their equipment, their sudden disappearance must be put down to consideration for the feelings of the more nervous. Their course lay along the tramway track until the ti-tree scrub was reached, passing on the way several Sordid Wood Swallows whose conduct indicated that their nests were near. Superb Warblers, Black Fantails, and Australian Pipits were also noted, but as rain threatened, the friendly shelter of scrub proved acceptable. On viewing the Bay, Gannets, Bass's Straits Terns, and Silver Gulls were seen skimming over the water. Skirting the scrub for a short distance, the notes of the Pallid Cuckoo were heard. New Holland Honey-eaters were very plentiful on the Banksias, which, being in blossom, proved very attractive to them, and discoloured their plumage. Near the roadside, in a leaf of dead bracken fern, a Sericornis had built its nest and was rearing its brood. Here the little White-shafted Flycatcher, Robins, &c., were noted; while in the scrub Burmese Doves and Yellow-breasted Robins were heard. On the homeward track towards Sandringham, two Brush Wattle Birds were shot, and many others seen. A young Mountain Thrush next flitted across the road, accompanied by the parent bird, thus proving that although the months of October and November are regarded as the best ones for the oologist, many of our birds lay as early as the beginning of July. Pace had to be quickened now to catch the train after a pleasant but rather unsuccessful outing.

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#### ORNITHOLOGICAL.

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#### *POLYTELIS ALEXANDRÆ, OR THE PRINCESS OF WALES PARRAKEET.*

*To the Editor of the Victorian Naturalist.*

SIR,—With much pleasure I have read Mr. Augustus Forbes-Leith's letter regarding this bird, and I trust I shall be able to satisfy him that it is a distinct species and not a hybrid between *Polytelis melanura* (the Rock-Pebbler) and *P. barrabandi* (the Green Leek).

Since the date of my former letter, which was reprinted from the *South Australian Register* of 23rd August, 1890, into your February number, I have been informed by Mr. S. G. Hübbe, of our Civil Service, that he many years ago shot similar birds in the neighbourhood of the Hanson and Woodforde Rivers, and within the past few months Dr. E. C. Stirling, who accompanied our

Governor, Lord Kintore, on his recent journey across from Port Darwin to Adelaide, saw a small flock of these birds (out of which he shot three) near Newcastle Waters. He had seen the two cage birds which I mentioned last year, and not only kept a careful watch for the species on his journey, but made inquiries about it at various places in the interior, with the result that he found several persons who said that they had seen it in different localities, extending nearly as far eastward as the Queensland border. He tells me also that he has since heard of its being seen upon the Victoria River. One of the birds which he shot escaped while the doctor was reloading his gun, but the skins of the two others are now in our museum. It is a strange coincidence that Mr. F. G. Waterhouse, the discoverer of the species, about 29 years ago, in the same locality, saw one flock only, and shot three birds. In Dr. Stirling's specimens, which are both males, the colours are, perhaps, a little brighter than in the living birds which I described last year. The patches of green on the wings are certainly larger, and in the length of their tails they exceed any specimens of *Polytelis melanura* or *P. barrabandi* that I have seen. The one specimen measures 17 inches in total length, the other 16 inches, while the tails measure about  $12\frac{1}{4}$  and  $11\frac{1}{2}$  inches. I admit that there is a good deal of resemblance in the general colouring to the female Rock-Pebbler, but the red markings on the wings of the latter are entirely absent, and neither *P. melanura* or *P. barrabandi* has the patches of pale blue on the crown and on the rump that are found in this species. The rose-pink on the throat, cheeks, and sides of the neck in *P. alexandriæ* covers about the same spaces (with the exception that there is none on the forehead) that are occupied by the yellow and crimson in *P. barrabandi*, and this is the extent of the resemblance in markings of the two species.

*P. alexandriæ* has been found in places nearly 600 miles apart, and also in parts of the intermediate country, but I have no knowledge of any specimens of either *P. melanura* or *P. barrabandi* having been brought from any portion of the interior inhabited by this bird. If the supposed (comparatively) new species is a hybrid, scattered over such a large extent of country, surely the parent birds must be there also, and they are not species that would escape observation.

I find that I was mistaken when writing my former letter in thinking that no museum in the world contained a specimen of this bird, as Dr. Ramsay, of Sydney, informs me that one of those obtained by Mr. Waterhouse is now in the Dobroydi collection at Ashfield, New South Wales.—I am, &c.,

M. SYMONDS CLARK.

ADELAIDE, 20th August, 1891.

THE OCCURRENCE OF PARRA GALLINACEA, TEMMINCK, IN VICTORIA.—Last Saturday I was afforded an opportunity of inspecting a very useful collection of Victorian insectivorous birds in the museum of the Government Entomologist (Mr. Charles French, F.L.S.) Among them I noticed the Comb-crested Parra—a bird hitherto unrecorded for Victoria, although it has been noted for the adjacent colony, New South Wales. I have since ascertained that Mr. A. Coles, the taxidermist, supplied the bird, which came, with three others, from the Boort Lakes district, where they were shot last year by Mr. J. L. Ayers, a duck shooter. The season before Mr. Coles received one or two Parras from the same quarter. Therefore, it would appear that the specimen in the possession of the Government Entomologist is not a solitary example of this remarkable water-surface walking bird occurring in Victoria, a fact not without interest to those who study geographical distribution.—A. J. CAMPBELL. 5th March, 1891.

ARE SEA BIRDS OFTEN DROWNED?—On Saturday, 12th September, in company with a detachment from Wesley College, I was naturalizing in the neighbourhood of Carrum. We strolled along the sands looking for any marine objects which might present themselves. To my surprise we picked up two dead Penguins—not just killed, certainly, but still in good enough condition for stuffing if it had been desired. There were no signs of the birds having been shot. How had they come to be cast on the shore of the bay? I believe that there are no rookeries inside the Heads, hence the bodies must have been brought in from the ocean. It does not seem likely that they had been thrown overboard from a vessel by someone who had tired of keeping them. According to a recent number of the *Athenaeum*, the author of "Rambles in a Fishing Village" (in Essex, England), states that sea birds, even Divers, are often found dead on the shore. They have, he thinks, been overtaken by storms when at a distance from shore, and beaten down on the waves like so many flies, until, wet through and exhausted, they perish miserably. Penguins, absolutely deprived of the power of flight, would be particularly at the mercy of a squall, *if caught by one*. But is not the instinctive knowledge of coming bad weather so strongly developed in these sea birds that it can only be on very rare occasions that they are overtaken at a distance from land? I should be glad to learn what some of our ornithologists who have studied the habits of the Penguins think on the subject.—A. H. S. LUCAS.

## NOTES ON DODONÆAS,

BY BARON VON MUELLER, K.C.M.G., M. & PH. D., F.R.S.  
DODONÆA HANSENII.

Tall, glabrous, hardly viscid ; leaves comparatively large, on rather conspicuous petioles, chartaceous, broadly and somewhat bluntly lanceolar, but more gradually narrowed into the base than into the apex, subtle-venulated ; racemes when fruiting below the leaves, corymbous, few-flowered or reduced to three or two flowers ; pedicels rather long ; sepals early deciduous ; fruit usually four-celled, its capsular portion hardly as long as broad, its appendages ascendingly divergent, considerably broader than high, rounded-blunt at the upper end, ceasing before the base and before the middle summit of the valves ; dissepiments seceding from the axis, closing permanently the fruitlets ; young seeds longer than broad, almost truncate and also turgescent around the hilum.

On Stuart's River ; Stephen Johnson.

Height to 12 feet. Well developed leaves, 2 inches long, always only slightly shining. Flowers yet unknown. Fruit-valves scarcely  $\frac{1}{4}$  inch long ; appendages from  $\frac{1}{3}$  to nearly  $\frac{1}{2}$  inch broad, venulous. Ripe seeds not yet obtained.

Among the few species with fruit-dissepiments seceding from the axis this comes nearest to *D. platyptera*, but the leaves are of larger size, of darker green, of thinner texture and not of conspicuously glandular punctuation ; further, the appendages of the fruit are perceptibly larger, and turn almost diagonally upwards, while those of *D. platyptera* remain nearly at a level with the vertex of the cells. The flowers and mature seeds may also yet show specific differences. From *D. pachyneura* our new plant is also distinguished by much larger leaves, with fainter and more divergent venulation, also by the greater extension of the fruit-appendages. The shape of the fruit is much like that of *D. macrozyga* and *D. megazyga*, but its dehiscence, as well as the foliage, are very different. The leaves resemble those of *D. lanceolata* and *D. triquetra*.

I have named this species in memory of Lars Hansen, of Huesbye, an ardent investigator of Schleswig-Holstein's flora through fully four decennia, with whom I was in frequent phytologic communication during the earlier of the fourtier years of this century.

D. LANCEOLATA.

Unrecorded localities : Tennant's Creek and Finke-River (Kempe), Adelaide-River (Tate), Port Darwin (Holtze).

D. PETIOLARIS.

Mount Oxley (Betche), Grey's Range (W. T. Neal), Bulloo (Mrs. Spencer), Paroo (Mrs. Cotter), Alice's Spring (E. Flint), between the Ashburton- and Gascoyne-Rivers (H. S. King).

Leaves more rigid than those of the preceding species, always slender-petiolate, never very long. Notes on the fruit given in the "Transactions of the R. S. of S. A.", xxiii., 51 (1887). The fruit to some extent resembles that of *D. physocarpa*, and is not readily dehiscent. Seeds globular-turgid, measuring fully  $\frac{1}{8}$ -inch, without any lustre, though quite black.

D. TRIQUETRA.

Cann-River (Baeuerlen).

D. PEDUNCULARIS.

Namoi (Musson).

D. TRIANGULARIS.

Dubbo (Betché), Sources of the Condamine-River (Scortechini), Canal-Creek (Hartmann).

D. BUSARIFOLIA.

Spencer's Gulf (Tepper), between Sharks-Bay and the Murchison-River (F. v. M.), South-Coast (R. Brown, according to specimens distributed from Kew). Fruit occasionally two-celled.

D. BAUERI.

Fowler's-Bay (Mrs. Richards), Kangaroo-Island (Tepper).

D. PROCUMBENS.

Grampians (D'Alton), a slightly pubescent variety.

D. CALYCINA.

Hunter's River (Miss Carter), sources of the Condamine River (Scortechini), Mitchell's Pinch (Bailey), Namoi (Musson).

When rarely some few pinnate leaves are produced, the plant verges towards *D. macrozyga*.

D. HEXANDRA.

Lower Murray-River, Hallot's Cove and Yorke's Peninsula (Tepper), Fowler's Bay (Mrs. Richards).

D. CERATOCARPA.

Goose-Islands Bay (R. Brown), Fraser's Range (Dempster), Mount Rugged (Miss Brookes), Serpentine River and Mount Burrabunup (F. v. M.)

Seeds very turgid, devoid of lustre, conspicuously strophiolated.

D. STENOPHYLLA.

Rosewood-scrub, near Moreton Bay (O'Shanesy).

In age at favourable places quite arborescent. The mode of its fruit-dehiscence separates this at once from *D. calycina*.

D. PINIFOLIA.

Arrowsmith's River (F. v. M.)

D. LOBULATA.

Kangaroo Island (J. E. Brown), Avoca (Rev. R. Thom), Fraser's Range (Dempster), Oldea (Tietkens), beyond Mount Rugged (Brookes), from thence the variety *pinnatula*, with leaf-lobes more distinctly developed into leaflets. Fruiting at a height of 2 feet, but attaining to 10 feet. The precise specific relation of some pinnate-leaved *Dodonæas* to some of the simple-leaved

species needs still further to be investigated ; the development of seedlings from the earliest stage should also be watched. Possibly hybrid forms may naturally occur, not yet recognized as such, and so it may be in numerous others of large Australian genera.

D. HUMILIS.

Wimmera-Desert (D'Alton), Kangaroo-Island (Prof. Tate), Fowler's-Bay (Mrs. Richards).

Young branchlets beset with minute hairlets.

D. LARREOIDES.

Near Sharks-Bay (F. v. M.), Mount Churchman (J. Young).

D. INÆQUIFOLIA.

Near Champion-Bay (F. v. M.), Mount Churchman (Young).

Leaflets to  $\frac{2}{3}$ -inch long, rarely indented at the upper end.

Dissepiments very small, persistent to the columellar axis.

D. TENUIFOLIA.

Warrego (Mrs. Spencer).

D. MICROZYGA.

Lachlan-River (Duff), Pedinga (Mrs. Richards), Eyre's-Creek (Kayser), Musgrave-Range (Giles), Fraser's-Range (Dempster) ; closely allied to the preceding species.

D. STENOZYGA.

Western end of the Great Bight (Carey), Yorke's Peninsula (Tepper).

Sepals slightly ciliolated, hardly shorter than the stamens ; anthers glabrous, apiculated.

D. BORONIFOLIA.

Hume's-River (F. v. M.), Cudgeyong-River (Jones), Black-Range, near the Wimmera (D'Alton), Grampians (Sullivan).

D. PHYSOCARPA.

Gilbert and Daintree-River (Armit), Hodgkinson- and Norman-River (Gulliver).

D. POLYZYGA.

King's Sound (Froggatt).

D. MEGAZYGA.

Seeds turgid, somewhat shining, estrophiolate. To this allied *D. Madagascariensis* (Radlkofer, in "Abhandl. des Natur. Hist." Vereins von Bremen, viii., 470, 1883).

DURING a ramble along the Kooyong Creek, Oakleigh, on the 15th ult., I was somewhat surprised to see hanging by its claws (as I thought) to a sharp-pointed limb of a gum-tree, about 20 feet from the ground, a specimen of the Ring-tailed Opossum, but upon closer observation I found that such was not the case, but that the unfortunate beast had in its flight become impaled by its pouch, thereby causing death. Perhaps it was a case of suicide through family troubles, as on examination I found the

pouch contained two young ones almost fit to leave her.—  
J. E. DIXON. 1st September, 1891.

PRESERVATION OF COLOUR IN DRAGON FLIES.—First, do not carry a cyanide bottle when collecting, but bring the specimens home alive, and let them remain in the box for at least twenty-four hours. By that time the contents of the stomach will have passed off, then the cyanide bottle can be used. Directly the fly is dead it should be operated upon by cleaning out its stomach and abdomen, which can be done in the following manner:—Obtain a long, fine darning needle, thread it with a short piece of thread, tie the ends together, and in the loop thus formed place some soft darning cotton the same colour as the predominant colour of the body, blue, yellow, or whatever it might be, and according to the thickness of the body have two or more strands. The needle should then be inserted between the fore legs and passed through the entire length of the insect, pulling the cotton through until it has cleaned out the contents of the thorax and abdomen. Cut off the cotton at both ends. If the precaution is taken to damp the last portion pulled through with carbolic acid no insect will attack it in the cabinet. Coloured floss silk may be used instead of cotton with advantage. The insect is now ready for setting. Another great advantage in preparing them this way, the abdomen does not drop off; the smaller species can be treated after the same fashion, but it is not necessary to use the thread loop. Simply thread the fine needle with silk, and pass through as before.—G. G. Bignell, F.E.S., in the *British Naturalist*.

NOTE ON A SOCIAL FORM OF ROTIFER.—On the 20th June Mr. Mann and myself visited Heidelberg to search the lagoons near the river for Rotifera, &c., and Mr. Mann took a very beautiful colony of a social form of Rotifera, which he handed to me, and which I have mounted and brought for exhibition. The colony was attached by a filament about a quarter-inch long to a piece of weed, and consisted of a gelatinous sphere about one-tenth or one-twelfth inch in diameter, pierced with holes radiating from the centre, each hole being occupied by a rotifer. There would be over 100 individuals in the colony. Reference to Hudson and Gosse's work showed that the form agrees very closely with the genus *Lacinularia*, but differs from *L. socialis* (the only species of the genus described by those authors) in the shape of the corona, being heart-shaped in *socialis*, while in the form shown it is oval. It is, therefore, probably a new species of *Lacinularia* or a variety of *L. socialis*. The action of the solution used to kill the animals probably caused the detachment of most of the adult forms, and thus permitted several slides of individuals being prepared, as well as one showing the sphere with sufficient individuals remaining on it to exhibit the arrangement when perfect.—J. SHEPHARD.

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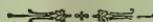
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VOL. VIII.—NO. 7.

NOVEMBER, 1891.

# The Victorian Naturalist:

THE JOURNAL AND MAGAZINE

— OF —

The Field Naturalists' Club of Victoria.

PUBLISHED NOV. 7, 1891.

Editor: A. H. S. LUCAS, M.A., B.Sc.

The Author of each article is responsible for the facts and opinions he records.

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VOL. VIII.—No. 7. NOVEMBER, 1891. No. 95.

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FIELD NATURALISTS' CLUB OF VICTORIA.

THE monthly meeting of the Club was held in the Royal Society's Hall on Monday evening, 12th October. Mr. C. Frost (one of the Vice-Presidents) occupied the chair, and there were about 70 members and friends present.

LIBRARIAN'S REPORT.

The hon. librarian presented his report of donations to the library, which included the following :—“Quarterly Reports Mining Department, Victoria,” June, 1891; “Records Australian Museum,” i., 8; “Transactions of Geographical Society, Australasia (Victoria branch),” ix., 1.; “Journal of Pharmacy,” September, 1891.

REPORT OF A RECENT EXCURSION.

Mr. A. J. Campbell, F.L.S., read a report of a recent excursion to Werribee Gorge, when he, in company with Mr. C. C. Brittlebank, acted as leader. Ornithological specimens were the objects of search, but only a few fell into the hands of the naturalists as compared with the spoils taken on last year's excursion, but the general surroundings offered plenty of scope for observation, and several excellent photographic views were obtained. The main gorge and many of its tributary gullies were explored, and general regret was expressed at the havoc wrought by the late floods. It is calculated that some 20 or 30 years must elapse before the banks of the river will be margined with trees and shrubs as they were before.

ELECTION OF MEMBERS.

The usual ballot of new members then took place, the following being unanimously elected :—Mrs. C. E. Andrews, Miss Burkett, Miss G. Sweet, Miss F. Thompson, and Messrs. E. T. Carter, J. L. Bowen, D. E. Martin, G. J. Page, W. Strickland, and J. B. Walker, thus bringing the number of new members elected since May last up to 40.

PAPERS.

Mr. J. E. Prince was prevented through indisposition from

communicating his paper on "Phenology and Rural Biology," and thus the only paper of the evening was contributed by Mr. J. P. Eckert, and had reference to "Some peculiar changes in the colour of the flower of *Swainsonia procumbens*." When the flower opens the corolla is lilac, and the first change is noticed in the longitudinal venules of the largest petals, which soon after assume a deep crimson. Then, at two different points of the petals a dark blue is noticed, which gradually extends over the whole surface, the peripheral portion being a little paler in colour. In the central portion the colour varies through all the shades of blue till finally it assumes a rosy tint. Frequently the petals will assume their original colour for some days, and afterwards go through all the gradations of colour once more. Mr. Eckert assigns the cause a meteorological one, that arch scourge—the north wind—being very effective towards its accomplishment. Experiments with the electric current give almost conclusive testimony in favour of the hypothesis. In speaking upon the subject, Mr. T. Steel, F.C.S., gave some interesting details as to the application of the spectroscope to this particular branch of study.

#### NATURAL HISTORY NOTES.

The first note was handed in by Mr. C. French, and had reference to the introduction and exhibition of the first rhinoceros in London. A second note recorded some facts as to the habits of snakes in swallowing their young, which Mr. D. Le Souëf corroborated by cases which had come under his own notice. Mr. G. Renner also furnished a note relating to the therapeutic value of Eucalyptus extracts, especially its application in cases of severe influenza.

#### EXHIBITION OF SPECIMENS.

The exhibits at the meeting consisted principally of wild flowers gathered in from different parts of the colony, the following being the exhibitors:—Mrs. Flatow, Miss Roberts, Misses Taylor, Baron von Mueller, and Messrs. G. Coghill, W. F. Gates, E. R. Hammett, E. H. Hennell, J. G. Luehmann, W. Scott, and H. T. Tisdall. An account in more detail of these exhibits is being prepared and will appear in a subsequent issue of the *Naturalist*. Mr. C. French, sen., exhibited an Eel, forwarded to him by Mr. J. Sach, which had been pumped up by a centrifugal pump at Benjeroop, Lower Murray River. The specimen is of interest, since it has been asserted that the eel has never before been found in the Murray so far down the river. Mr. H. Hill—a case of Victorian and other Lepidoptera; Mr. F. Spry—Larva *Thalassodis lithocroma* (Myk.), Larva, Chrysalis, and Butterfly of *Oyyris abiota* (with food plant), and Eggs of *Delias aganippe* (Don).

## THE WERRIBEE GORGE EXCURSION.

*3rd October, 1891.*

FOR this most interesting locality only five members put in an appearance at the *rendezvous*. If that small number represents the vitality of a club with some 200 members—well, perhaps, the least said about it the better. At all events, 14 or 15 names were handed in for the excursion, which warranted the co-leaders in ordering breakfast beforehand, at Bacchus Marsh, for at least a dozen. You should have seen the faces of the landlady and her dutiful daughters when only 5 put in an appearance! Then it was fun to witness some of the coach horses whipped home in disgust. Two extra conveyances were brought in seven or eight miles in anticipation of the names furnished, and had to return empty. Moreover, the good mother of one of our co-leaders, at Myrniong, had prepared a sumptuous evening repast for the full number of 15—a fitting termination for the day's work—but only the 5 beforementioned, *plus* 3 local members, turned up; and be it said to their credit, well did they endeavour to do justice for the 15. Now, all this is very disappointing of course for those members who remained at home. However, some sent written excuses on account of sickness—probably the remainder were detained through the *appearance* of rain. Surely their ardour is easily damped. Rain did fall on the Friday evening, and such refreshing rain that the local farmers said they would have rather seen the much-needed moisture than a whole cloud of naturalists. As it was the Saturday turned out most delightfully fine, one slight shower only fell about 4 o'clock, therefore none of the party got wet except one member, who fell into the river.

The five members who left town were Messrs. De Le Souëf, G. Sweet, J. Ashworth, A. J. Campbell, and E. H. Hennell, who were joined at Myrniong by three local members, Messrs. C. and T. Brittlebank and J. Lidgett. The gorge was entered about 11 o'clock, and by late in the afternoon its whole length was traversed and some tributary gullies explored. The scramble among such romantic surroundings was fully enjoyed by the party, with the varying scenes of native grandeur opening up at every bend. Here was a cliff of slate rock 200 feet high, with a miniature cascade at its foot; there, blocking up and turning the river's course a pyramidal crowned hill about 400 feet in height, where trees and scrub cling on amongst their rocky environments. And so on till the greatest elevation—600 feet—is attained above the river's bed, forming a singularly beautiful vista, the steep hill side being fairly clothed with timber and capped with a pile of naked rocks, now known as the Falcon's Lookout.

Some photographs were taken with excellent effect, especially

of the scene last mentioned, also pictures were taken of an eagle's aerie, a nesting tree of the Boobook Owl, and the nest *in situ* of a Sericornis cunningly cleft in a mossy bank. But it was observed by those who had visited the locality before that the destructive flood of last August had wrought great havoc with some of the most beauteous portions of the gorge, especially near the river. Some of the scenes depicted at the Club's last *conversazione* have been entirely obliterated. Judging by the former great flood (1863) it will be nearly 30 years before the river banks will be so beautifully margined with stately trees and shrubs. That is, of course, provided no other destroying flood occurs in the interim.

Birds were scarce compared with those observed by a contingent of Mr. Keartland's Melton excursion that visited the Werribee Gorge exactly this time last season. Six or seven species of orchids were noticed flowering. About the same number of ferns were seen. Many of the ironbarks and box-trees were in bloom, while the river's banks were adorned with several showy shrubs in flower.

Some instructive geological notes bearing upon the locality, and remarks upon impressions of leaves and fruits, will be probably offered by Mr. Sweet on another occasion.

A. J. C.

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#### A CORRECTION.

In the report of the Club's excursion to Brighton I misnamed a rotifer *Notops clavulatus*; it should have been *Asplanchnopus myrmeleo*. When this was first examined by me, for purposes of identification, the supplement to Hudson and Gough's "Rotifera" was not procurable; but it has since been unearthed in the Public Library through the persistence of one of our members. This rotifer possesses a foot very like that of *Notops clavulatus*, and as the genus *Asplanchna* excludes all species with feet, I was led to look elsewhere for its position. In the supplementary part of the work mentioned a new genus is included, specially for the reception of this and two other species.

I further found that the supplement mentions, and somewhat meagrely describes, a rotifer as *Lacinularia pedunculata*, found by Mr. Whitelegge in New South Wales, agreeing, so far as the description goes, with the *Lacinularia* I made the subject of a note recently. This is mentioned by Dr. Hudson in his recent presidential address to the Royal Microscopical Society as a "prize."

J. SHEPHARD.

## SOME PECULIAR CHANGES IN THE COLOUR OF THE FLOWER OF SWAINSONIA PROCUMBENS.

By J. P. ECKERT.

(*Read before the Field Naturalists' Club of Victoria, 12th October, 1891.*)

THE *Swainsonia procumbens* rouses the keen interest of the naturalist in regard to the variability of the occasional changes in the colour of its petals. There are also certainly other plants which undergo a peculiar change of colour in the flower, but in these cases the change is final, *i.e.*, the colour does not return to its prior state, or it is effected by the higher or lower temperature, or the more or less intense action of light together with the chemical action of protoplasm and cellulose.

For ten years I have during every spring paid special attention to the *Swainsonia* species, and more so to the change of colour in their petals. When the flower opens the corolla is always lilac (rarely perfectly white, although I found a beautiful specimen of purest white last spring). A day or two after the flower is opened the alteration commences. Why this alteration does not commence immediately after the blossom is out is very difficult to account for; but I should think that it might be due to particular substances not being yet formed, and whose formation depends upon the action of light and heat. The first change of pigment is noticed in the longitudinal venules of the largest petals. These assume a deep crimson, then at two different points of the petal a dark blue is noticed, which gradually expands to about nine-tenths of the diameter of the whole petal, one-tenth of it—the periphery at the same time decreasing in brilliancy as the other increases—assumes a paler appearance in proportion to the other. The variability in the central portion is from deep dark blue through all colours of blue to rose in one and the same individual. Frequently the petal will assume, after having undergone the different changes, its original pigment, *i.e.*, such as it had when it opened, and remain so for some time and then precisely repeat the whole reaction; but the phenomenon becomes still more striking by the fact that the act of changing the colour appears to come to a standstill for even days—for not the slightest variation either way can be noticed—when suddenly the act, as before described, will be repeated with the utmost precision. As regards the white specimen I mentioned, I had an opportunity to observe that closely too. I visited the plant nearly every day for a month and noticed its peculiarity. Being pure white, it naturally must follow that the metamorphosis (if I am permitted to call it so) was, in appearance, slightly different, although in its essential parts it was much the same. The longitudinal venules appeared originally of an extremely transparent

tint. The intervenular space showed a peculiar spectrum, a spectrum including all its usual colours except blue, whereas in the petals, under the ordinary colour, the spectrum appears complete. Strange as this sounds, yet it is a fact. Afterwards the petals assumed a very faint gray, almost tending to blue colour; the central portions became very slightly pink, increasing to almost a violet tint, thus giving the flower a most soft and tender appearance. Otherwise it differed not from the ordinary state. At first I was led to think the described variability was chiefly due to the difference in soil; but I am now, after careful observation and comparison of its regional distribution, convinced that this is not the case, as the same phenomenon may be noticed on all kinds of soils. Taking into consideration that temperature and light have effect upon colour, I commenced a series of notes to that effect. Purposely I planted, some time ago, a *Swainsonia procumbens* in my flower garden, so as to have a better opportunity to make notes about it. Comparing the one I have in my garden with those growing wild, I found them always to be alike as regards the colour. This fact, then, would naturally point to another cause, and this I think is solely a meteorological one. I am fully aware to what danger I expose myself of being ridiculed at this idea, but I shall try to explain.

On sultry spring days the variability of the colours is the greatest, increasing or decreasing in intensity according to the temperature. When the sky is "overcast" and almost a calm reigns, and indications are for a change, the petals of *Swainsonia procumbens* are dark blue, the venules crimson with ramifications of same colour at an acute angle. Should a north wind prevail, the venules become blue and the petal violet in the centre, and surrounded by prussian blue merging into light lilac, the periphery being pale or rather grayish; but whenever an electric tension of the atmosphere is present, the longitudinal venules become much broader, assume a much deeper colour, and affect also the intermediate cells, the remainder becoming of brilliant indigo. As soon as a discharge of the electric tension has taken place, the colour again changes to its original state, but the same process is repeated an almost indefinite number of times in the same individual.

This season I have experimented with this flower. I have taken a newly but perfectly opened blossom, noted carefully its colour in all its parts. Having done so, I cut off a small portion of the petal and exposed the remainder to a strong electric current. A change was noticed immediately, the longitudinal venules appeared rose, and the central portion became deep blue. Cutting a portion of this part, I placed both this and the piece I cut off before into some hydrochloric acid for a few minutes, then mounted them for microscopical examination. This examination shows

the difference strikingly. That portion (No. 1) through which the electric current was not passed differs distinctly in the division of its cells from that through which it was passed (No. 2). In No. 1 the cells are regularly dispersed, the parenchyma unbroken, and the parenchymatous cells undisturbed and in outline very regular ; whereas, in No. 2, the cells appear irregular, with the parenchyma broken, the cell-wall ruptured, and the parenchymatous cells scattered about. The process with the electric current was tried upon another petal in the same manner as in Nos. 1 and 2, but the chemical treatment was afterwards with ammoniated sulphate of copper. The effect upon the cellulose and parenchyma is also very plain there, although not quite so, on account of the intransparency of the specimens.

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#### MAORI PRESERVED HEADS OF NEW ZEALAND.

By THOS. STEEL, F.C.S.

(*Read before the Field Naturalists' Club of Victoria, 14th September, 1891.*)

AMONGST the Maori inhabitants of New Zealand, the institution of the *tapu*, whereby certain objects were made to be considered sacred or reserved, was very prevalent. This superstition applied with especial force to the persons of chiefs and of priests, and peculiarly to the heads of these individuals. So strict indeed was the institution that no ordinary person dare touch, or even mention or look fixedly at, the head of a chief, that part of his body being the most highly *tapu* of all.

Much ceremonial performance, for instance, was gone through when his hair was clipped or cut, this operation being performed by a special official, by means of sharp shells, and very great care was exercised in the disposal of the cut-off hair, as it was supposed to afford a powerful talisman to any enemy into whose hands it might come. It is not surprising that great importance was attached to the disposal of the dead, and that much ceremony and mystery surrounded the rites of sepulture. The usual custom was to place the body in some spot more or less exposed, until the flesh had decayed, the bones being afterwards carefully scraped with shells and stowed away in caves, hollow trees, and such-like hiding places. Particular regard was paid to the remains of chiefs ; the skulls were rubbed over with the sacred *kokowai* or red ochre, and preserved with special care. Occasionally, in case of individuals who had more than usually distinguished themselves as warriors, or as wise leaders of their people, the heads were preserved intact with the flesh, and were regarded with much veneration. Sometimes, also, the head of a relative, child, or wife would be preserved. From what informa-

tion is now available it appears that the Maori did not habitually preserve in this way the heads of slain foes, but that the custom of doing so arose when a demand for the heads by white traders sprang up with European intercourse.

It may be interesting at this stage to glance at a few analogous customs amongst people of other parts of the world. Head-hunting, amongst savage races, is by no means an uncommon proceeding. In Africa, New Guinea, and elsewhere, tribes have been known as "head-hunters," from the custom prevailing amongst them of securing the heads of their slain enemies, which, after being divested of the flesh, were preserved as trophies.

In the island of Mallicollo, in the New Hebrides, the entire body, I understand, was sometimes preserved. A mummy of this kind was taken from Mallicollo to Fiji by a labour schooner. Unfortunately, the parties into whose hands it fell did not think it worth taking care of, the skull which I have here being the only part that was preserved ; it was given to me by the gentleman in whose possession I noticed it. The peculiar characteristic elongation of the skull, produced by compressing the head of the infant with bandages, is well marked in this specimen, and especially when put alongside of typical Fijian skulls such as I exhibit. I have seen many natives of Mallicollo, their long heads, caused by this early compression, being very noticeable and interesting.

The Melbourne Science and Art Museum possesses a highly interesting specimen of a preserved chief's head from Port Sandwich, Mallicollo Island, mounted on an artificial body, and used as a memorial of the departed chief. It is described as a head dried and put on a carved statue, painted and decorated, and put up so that the dead chief may still look on departed friends. Native name *Ramej* (j=tch) *Pipise*. "*Ramej*" means "people dead," and is a word used to represent souls or spirits ; "*Pipise*," to tie or fasten, as the arrow head to the shaft. Such specimens as this are most valuable, and are becoming increasingly scarce and unobtainable.

In the Australian Museum, Sydney, there is a very curious specimen—the dried skin of the head of a native of Fly River, New Guinea. The bones appear to have been entirely removed, and the skin stuffed and dried. In the same museum is a fine specimen of a dried head of a native of Lord Howe's Group. This head is quite as well preserved as the Maori specimens ; the features are very clear and distinct, and have a peculiar pallor of complexion as compared with Maori heads, which is probably due to some difference in the method of preserving.

Brough Smyth in his "Aborigines of Australia" gives much interesting information regarding the customs of the Australian aborigines in preserving bodies and parts of bodies. Mothers

would carry about with them the body of a dead child, even when in an advanced state of putrefaction, and in times gone by the dried hand of a deceased relative was highly valued, and was carried about as a means of indicating the source of any threatened danger. An excellent specimen of a dried hand is in the Melbourne Museum, and is considered by Mr. A. W. Howitt to be the only known existing specimen in Australia. An interesting account of the manner in which it was used is attached to the specimen. When it was desired to utilize the powers of the hand it was held before the face of the owner, who turned round and round so as to face all directions, and the hand was supposed to oscillate in the direction of the threatened danger. This use of a hand is extremely interesting and suggestive, reminding us forcibly of the old Jewish rite of the holding up of hands, as when Joshua was fighting with Amalek, and "when Moses held up his hand, Israel prevailed," and when "he let down his hand Amalek prevailed"—Exodus xvii. To this day the holding up of a hand is one of the ceremonial performances amongst the Arabs, and hands made of silver and carried on long poles are prominent objects in the religious festivals of the Mahometans of India. The hand of God is frequently alluded to in the Bible as going before the people as a protector and guide. It is very curious to find the Australian aborigines imbued with so very analogous a belief.

Ancient Egyptian mummies are familiar examples of perfect preservation of human and other bodies.

In the Queensland Museum, Brisbane, there are a couple of cases containing dried or mummied bodies of Australian aborigines from North Queensland. The Australian Museum, Sydney, contains a mummy or dried body of an aboriginal woman, from Cairns, Queensland.

Amongst the North American Indians, and some of the old races of South America, the preservation of human bodies, entire or in part, was a widely spread custom.

There is in the Melbourne Science and Art Museum a most curious preserved head, the only one of the kind which I have seen. It is described as being obtained from the tribes of the Napo, a tributary of the Amazon River. A tribe named Jivaros preserve the head of hostile chiefs slain in battle. The head is first put up on a pole to be insulted and jeered at. The bones are then removed from the head, and the flesh and skin with the hair attached, carefully dried and preserved. In this operation the head shrinks to perhaps one-third of natural size, but the outlines, and even expression of the features, are preserved in a remarkable degree. The head is then used as a friendly deity, to indicate the right times for going to war, to hunt, &c. This description is condensed from that accompanying the specimen. Again,

a somewhat striking analogy to the Maori head-preserving practices was that of the more civilized races of the Old World, in the exposure at city gates and other public places, of the heads and dismembered bodies of executed persons.

Of course the preservation of human heads is long since become a thing of the past in New Zealand, but the skill displayed, and the surprisingly permanent results attained by the Maori in this art, have been frequently commented upon.

The Maori at all times greatly dreaded the falling of the bodies of their compatriots into the hands of their enemies, and particularly so in regard to the head. Judge Manning, in "Old New Zealand," illustrates this with the following interesting anecdote:—"A small party of Maories had been surprised by a hostile tribe. Two brothers were flying for their lives down a hillside; a shot broke the leg of one of them and he fell. The enemy were close at hand. Already the exulting cry, 'Na! na! mate rawa!' was heard. The wounded man cried to the brother, 'Do not leave my head a plaything for the foe.' There was no time for deliberation. The brother did not deliberate. A few slashes with the tomahawk severed his brother's head; he escaped with it in his hand, diied it, and brought it home." During the Maori war the British forces had numerous illustrations of the same sentiment, the Maoris always, if possible, carrying away their dead, according to their invariable custom. The body was generally dragged by tying a flax rope to the ankle.

When the body of a chief or other leading man was captured by his enemies, the body was usually eaten, but the head was stuck up in the village of his captors, where it was subjected to insult and contumely; the women and children would jeer and spit at it, and the captor would address it in taunting language.

Dr. Thomson, in "The Story of New Zealand," says:—"The heads of fallen chiefs were carefully preserved from decay by an ingenious process, and deposited with their ancestors' bones, to be brought forth on future occasions to excite men to revenge their deaths. The bloody heads of the enemy were stuck round the fences of the village for the purpose of being insulted. 'What,' said a chief to one of these trunkless heads, 'you wanted to run away, did you, but my *meri* overtook you, and after you were cooked you were made food for my mouth. And where is your father? He is cooked! And where is your brother? He is eaten! And where is your wife? There she sits, a wife for me! And where are your children? Here they are with loads on their backs carrying food as slaves.'"

The belief was that the head was perfectly sensible of all that transpired, the Maoris believing that the soul remained for some days after death. It was not customary to permanently preserve the heads of slain foes, the operation being only carried out on

those of valued chiefs, or sometimes of a beloved wife or child.

We have the testimony of those who were conversant with the Maoris in the early days as to the methods pursued, and the best accounts appear to be that quoted from Rutherford's Journal, in a rather scarce work, "The New Zealanders," published in London in 1830 by the Society for Promoting Christian Knowledge. We cannot do better than repeat the quotation here, as giving clearly and precisely the details of the process:—"The skull is first completely emptied of its contents, the eyes and tongue being likewise extracted, after which the nostrils and entire inside of the skull are stuffed with flax. At the neck, where the head has been cut from the body, they draw the skin together like the mouth of a purse, leaving, however, an open space large enough to admit the hand. They then wrap it up in a quantity of green leaves, and in this state expose it to the fire till it is well steamed; after which the leaves are taken off, and it is next hung up to dry in the smoke, which causes the flesh to become tough and hard. Both the hair and teeth are preserved, and the tattooing on the face remains as plain as when the person was alive." These preserved heads are now become very scarce. I have not seen specimens in any of the colonial museums which I have visited, except in the Auckland Museum; but I have not been in any of the museums of the South Island.

A specimen in the Auckland Museum was curiously enough procured from London for the Museum, within very recent years. It may be of interest to give an incident regarding this specimen, which was related to me by Mr. Cheeseman, of the Auckland Museum. On the Upper Waikato River was one of the numerous sacred caves used by the Maori as a place of sepulture for the bones of the dead. Of course no one was allowed near the spot. It was reputed that in this cave there was the preserved head of a very famous old chief. Some Europeans had tried to get access to the cave for the purpose of exploring it, but were unable to do so because of the stern refusal of the Maoris to allow them near it. About this time it so chanced that the Auckland Museum authorities acquired by purchase, in London, a specimen of a dried head, which was duly deposited in one of the show cases. Some Maoris, visiting Auckland from the Waikato, happened to see the head in the Museum, and at once concluded that the *Pakeha* had succeeded in eluding their vigilance, and had taken the head from their cave. A hasty examination of the cave was made, and no head being found in it, the conclusion was deemed confirmed, and a great uproar arose. It being against the law to disturb Maori burial-places, the colonial Government had to inquire into the matter, and the curator of the museum had some difficulty in showing that the

charge was false, but fortunately was able to do so. The Maoris were never quite satisfied, however, that the head had not been stolen from the cave.

The motives which induced the Maoris to go to all the trouble of preserving the heads of dead chiefs in this way would appear to have been much the same as lead us to preserve with jealous care the revered ashes of the good and great amongst our fellow men, and to erect stately monuments to their memory. The Maoris were eminently a people of legends and traditions, taking great pride in the glory of departed ancestors, and in handing down the story of their valorous deeds. The doings of the chiefs for many generations past were religiously kept in remembrance and recounted by father to son, and so handed down as a legacy, just as were the folk-lore and unwritten history of the people of the old world.

The tattooing, or *moko*, on the face of a chief was pregnant with meaning, it was no idle or whimsical pattern, but to the expert interpreter each turn and line had its appropriate significance, there being very distinct differences in the *moko* on the faces of different individuals. The wish to keep some tangible memorial of a deceased person of distinction would very naturally lead to the preservation of the head bearing the revered *moko*.

Very curious and interesting were the customs of the Maoris at the meetings held for the purpose of lamenting over the past. Everything of moment amongst savage races is celebrated by feasting and ceremony. At the Maori *tangi* mournings for the past were indulged in—the friends who had died were brought to remembrance amid much wailing and crying ; and no one who has not heard the Maori *tangi* knows what a weird, melancholy sound it is.

The *hahunga* was a feast celebrated with the object of recounting the past glories of deceased chiefs, and inciting the warriors to emulate their greatness or to revenge their death. At these times the deeds of valour and of wisdom of the dead were recounted with all the glowing oratory so natural to the Maori :

“ With weeping and with laughter  
Still is the story told,  
How well Horatius kept the bridge  
In the brave days of old.

\* \* \* \* \*

“ And wives still pray to Juno  
For boys with hearts as bold  
As his who kept the bridge so well  
In the brave days of old.”

—Macaulay, “*Lays of Ancient Rome.*”

In concluding, I wish to mention what appears to be a curious phenomenon about the preserved head in my possession. Before

the head came into my hands it had been neglected, and the most of the hair had been destroyed by moths. I kept it in a close box with plenty of camphor, and some time after I noticed a thin growth of very fine scattered hair in patches over the scalp. I was much surprised when I observed this, some years ago, before I came to Australia. Since then the head has been kept in a box in Glasgow, without any special care, but my younger brother, who was not aware of my having noticed the hair, in sending it out to me a few months ago, called my attention to the growth, which he also had noticed. In order to gain definite information, I have marked a part of the scalp with a circle of lead pencil, and have closely shaved the hair from it. As there were signs of the depredations of insect larvæ in the dried flesh, I carefully injected all parts save that reserved for the hair observation, with an alcoholic solution of corrosive sublimate. This had the effect of dislodging a couple of fat grubs.

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#### DESCRIPTIONS OF NEW AUSTRALIAN PLANTS, WITH OCCASIONAL OTHER ANNOTATIONS,

By BARON VON MUELLER, K.C.M.G., M. & PH. D., F.R.S.

(Continued.)

##### PEPEROMIA ENERVIS.

Rather dwarf, erect or diffuse, flaccid, glabrous ; branches upwards angular ; leaves small, on short petioles, ternately or some quaternately verticillate, cuneate-obovate, the lateral venules almost obliterated ; spikes extremely slender, mostly terminal, conspicuously but thinly pedunculate ; flowers in close proximity ; bracts very minute, orbicular ; ovary almost entirely emersed, bearing the stigma obliquely ; fruitlet minute, almost globular.

On Mount Bartle Frere ; Stephen Johnson.

From some few inches to nearly one foot high. Leaves  $\frac{1}{2}$ - $\frac{3}{4}$  inch long. Spikes solitary or occasionally two together, generally 1-1½ inches long. Flowers unknown. Fruitlets, when dry, slightly rough. Mons. Casimir de Candolle, who received specimens from me, to bring his unrivalled knowledge of Piperaceæ to bear on this singularly local plant, places it near *P. obversa* among the 370 Peperomias, known to him since describing them monographically in 1869. It received the specific name under our joint authority. Lately also a representative of the order (*Piper Holtzei*) has been discovered in N.W. Australia.

##### GARCINIA WARRENII.

Glabrous ; branchlets robust, angular ; leaves of firm texture, on short petioles, mostly lanceolar-ovate, their primary lateral venules numerous and somewhat prominent particularly beneath ;

flowers rather large, crowded into axillary clusters ; outer sepals very short ; petals four, largely pale ; staminal mass of the male flowers divided almost to the base into four ovate lobes, about half as long as the petals ; anthers extremely numerous, densely covering the inner side of the lobes to near the base, pale, partly on very short filaments, partly sessile, their cells divergent, widely dehiscent ; rudimentary pistil rather thick, angular, with a convex stigma.

Near the Coen-River ; Stephen Johnson.

A tree, to 40 feet high. Well developed leaves 3-5 inches long. Flowers on short thick pedicels. Sepals almost semi-orbicular, the inner only about  $\frac{1}{8}$  inch long, though exceeding the outer. Petals obovate or verging somewhat into an orbicular form, incurved, with broad base sessile, seldom longer than  $\frac{1}{3}$  inch, in front slightly and irregularly denticulated. Staminal mass somewhat adherent to the petals. Anthers almost quadrivalvular. Rudimentary pistil about  $\frac{1}{8}$  inch long. Female flowers and fruit not yet seen. The staminal arrangement is much like that of *G. cornea* and *G. Merguensis*, but both are in several other respects very distinct. The leaves are not unlike those of the imperfectly known *G. neglecta* (Vieillard) ; the venulation of them is much more prominent than in *G. subtilinervis*, of which the flowers are unknown.

This in the flora of Australia very remarkable plant is dedicated to Dr. Warren, the accomplished and learned Professor of Engineering in the Sydney University.

#### GLOSSOGYNE ORTHOCHAETA.

Stem towards the base few-branched, somewhat woody ; leaves much crowded along the lower part of the branches and of the stem, mostly pinnately divided, their segments distant, narrow-linear, much pointed ; upper leaves few, remote, undivided, linear ; flower-headlets solitarily terminating elongated simple peduncle-like branches ; involucral bracts rather numerous, somewhat scarious towards the summit and thus far soon reflexed ; floral bracts bluntish ; receptacle rather ample ; fruits numerous, about as long as the bracts, terminated into two much shorter quite erect slightly retro-hispidulous setules.

Near the South Coen-River ; Stephen Johnson.

Root not seen. Height to 2 feet. Leaves to 3 inches long, the lower often reflexed and some of these undivided. Corollas and therefore also stamens and stigmas not yet available. Fruiting headlets fully  $\frac{1}{2}$  inch in diameter. Fruits  $\frac{1}{3}$  to  $\frac{1}{4}$  inch long, compressed, narrow, blackish, streaked ; the setules often only at the apex barbed.

So far as the vegetative and carpologic characters allow to judge, this plant cannot be excluded from the genus *Glossogyne* ;

but it is possible that hereafter from floral notes another generic place may have to be assigned to this species. The bracts almost conceal the fruits ; this already gives the plant an aspect different to that of *G. tenuifolia* ; the ramification is also less, the leaves are longer and their segments narrower, furthermore the fruits are shorter and their setules not divergent ; the leaves are in form not unlike those of *Bidens lineariloba*, but seem never doubly segmentose.

#### CORRESPONDENCE.

*To the Editor of the Victorian Naturalist.*

DEAR SIR,—It may interest my fellow Naturalists to hear that one of our prettiest ornamental trees has been added to the list of "dangerous foreigners." Recent investigations following sad experiences have shown that the *Robinia pseudacacia* possesses very poisonous properties. In the establishment of a certain wood-turner, all the men working with robinia-wood, and therefore inhaling the fine dust, consisting of minute particles of the wood, suffered very severely. The *Pferdefreund*, a journal devoted to the interests of lovers of horse-flesh and horse breeders, reports that horses, after eating the leaves and bark of the Robinia, soon showed symptoms of paralysis of the hind legs, dying shortly after. The *post-mortem* examination proved the bowels, mucous membranes, and lungs to be affected by the poison. In other instances the horses which had eaten of the plant, and which were similarly affected, recovered, but remained extremely feeble for a long time after. The German *Pharmaceutic Gazette* now explains that the bark of the Robinia contains a highly poisonous albuminose (1·66 per cent.)

G. RENNER.

Department of the Government Botanist,  
28th October, 1891.

*To the Editor of the Victorian Naturalist.*

DEAR SIR,—I have been noticing one of our luminous centipedes. The light is spread over the lower surface of the body. The luminous matter appears to come from two glands, specially devoted for its formation. These phosphorescent glands on being pressed exudes a sticky, yellowish matter, possessing a distinctive disagreeable odour. A curious feature in this luminosity is that it comes and goes, which may be attributable to the various seasons ; but it is always present during the autumn. It has been suggested that this luminosity is connected with the pairing season.—Yours truly,

JAS. LIDGETT.

Myrniong, 3rd May, 1891.

DOES THE SNAKE SWALLOW ITS YOUNG?—"Surveyor," writing from Benalla, says :—"Twice in my experience I have seen the swallowing take place. On the bank of Lake Kariah, near Camperdown, I came upon a large brown snake lying on a bare patch. Several young ones, which appeared to be sunning themselves near by, took alarm on my approach, and with one accord turned towards the parent, which made a peculiar hissing noise, and widened her jaws. Into the opening glided in quick succession the young ones. Within twenty seconds or thirty seconds from my first seeing them they were all in, and the full-grown snake making for a place of safety. I killed the snake with a blow of my axe, and by examination convinced myself that I had not been the victim of an optical illusion. At Gooramadda, on the Murray Flats, I saw an adult brown snake swallow four young. On opening the body I found two of the young ones with their heads pointed towards the snake's tail, and two in the reverse position, showing that they had turned after entering. They were in what seemed to be a membranous sac lying parallel with the spine, and absolutely free from moisture; the sac pliable, and apparently highly elastic. I have on many occasions killed snakes which contained young, both alive and in the embryo or egg. In such cases it was evident that birth had not taken place, as the young were small, and the covering membrane or shell was in every case found with them."—*Australasian*, 19th September.

BEE AND EUCALYPTI.—M. Ricasoli informs the readers of the *Giornale di Acclimazione*, an Italian publication, that the flowers of the Eucalypti of the Mediterranean coast, and more especially those of the species *rostrata*, *diversicolor*, and *cornuta*, are visited by bees in such numbers as to make obtaining of herbarium specimens from these trees during the day impossible. Hence he concludes they must provide excellent food for the bees.

*Apropos* of the arrival of the first Rhinoceros in Australia—that which Mr. Le Souëf has secured for the Melbourne Zoological Gardens—we may quote the following item from the *London Gazette* for 1684 :—"A very strange beast, called by the learned Rhynoscerosus, has lately been brought from the East Indies, and is the first that has ever been seen in England. It can daily be viewed at the Bell Savage Inn, Ludgate Hill, from nine in the morning to eight o'clock at night. It has a tail like a pig, a horn like an elephant on its nose, and its body is encased with armour, proof against shot-guns. It has been visited by the court, the nobility, clergy and gentry, and scholars of repute, some of whom regard it as the Leviathan of Job, but cannot explain its being found in the East Indies. It is thought that His Majesty will shortly add it to his royal lions in the Tower."

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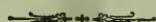
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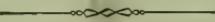
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VOL. VIII.—No. 8.

DECEMBER, 1891.

# The Victorian Naturalist:

THE JOURNAL AND MAGAZINE

— OF —

The Field Naturalists' Club of Victoria.

PUBLISHED DEC. 10, 1891.

Editor: A. H. S. LUCAS, M.A., B.Sc.

The Author of each article is responsible for the facts and opinions he records.

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VOL. VIII.—No. 8.      DECEMBER, 1891.      No. 96.

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FIELD NATURALISTS' CLUB OF VICTORIA.

THE ordinary monthly meeting of the Field Naturalists' Club was held in the Royal Society's Hall on Monday evening, 16th November. Mr. C. Frost occupied the chair, and there were about 80 members and friends present.

PROTECTION OF INSECTIVOROUS AND NATIVE BIRDS.

Baron von Mueller, one of the patrons of the club, was accorded a hearty welcome when he rose to advocate the protection of insectivorous and native birds. He thought that this object could be attained not only by putting a comparatively heavy tax upon guns and a greater strictness in carrying out the present laws, but rather, perhaps, by the initiation of some scheme which would enlist the sympathy and co-operation of all persons interested in the subject. To this end Baron von Mueller advocated the use of a distinctive badge to be worn by members if such a union were ever inaugurated. This subject has been before the Club several times during the present year, and it is hoped that some scheme of a practical nature will be set on foot before long.

PRIZE COMPETITION FOR NATURAL HISTORY SPECIMENS.

The chairman then communicated to the Club the details of a scheme which has been drawn up with a view to increase the usefulness of the Club. That this scheme may come directly under the notice of those for whom it is intended the details of it will be sent to the "heads" of the principal schools in the colony with a request that they will extend to it a helping hand. The competition, however, will not be confined simply to those pupils attending the schools to which a notice is sent, but *will be open to anyone in Victoria under the age of 18 years*. It is not intended to come upon the general funds of the Club for the prizes, and already a good many promises of help towards a special prize fund have been received, and the general outlook as regards the success of the scheme is very promising. The schedule and conditions of competition will be found in detail on another page.

## REPORTS OF RECENT EXCURSIONS.

Mr. R. S. Sugars then furnished a report of a recent excursion of the Club to Sassafras Gully. About 30 members visited this somewhat untrodden district, and were thoroughly rewarded by the delightful weather and scenery they experienced. They enjoyed a typical fern-tree gully, before the despoliation and vandalism of the ordinary excursionist has stripped it of its beauty. The inevitable log-rolling for cryptozoic fauna was indulged in, and some fine specimens of Peripatus, Nemertine, and Planarian worms were secured. The entomologists obtained a few specimens, and although the botanists, amongst whom we were glad to see our late President, Mr. C. A. Topp, did not find anything new, they met many familiar forms under very flourishing conditions.

The excursion to Clayton, 31st October, under Mr. E. Anderson, and that to Tooradin, 9th November, under Mr. C. Frost, fell through owing to unfavourable weather.

## ELECTION OF MEMBERS.

The usual ballot of new members then took place, and resulted in the election of Professor Elkington and Messrs. W. H. Ferguson, P. Miller, and W. J. Tiller.

## PAPERS.

The first paper was contributed by Mr. J. E. Prince, on "Phenology and Rural Biology, as Studies and Aids to Systematic Observation of Natural History." Much speculation had been rife as to the meaning and scope of "Phenology," and it was quite a relief to members to hear it defined as "the observation and recording of facts regarding the principal phases of the life-history of plants, insects, and birds." The introduction to the subject was devoted to proving its utility to the meteorologist, physician, scientific naturalist, agriculturist, and intelligent members of the community generally, and then the writer's remarks fell under the heads periodicity in natural phenomena, climate, insect pests, and migration of birds, and he concluded by advocating the distribution of schedules, which could be filled up, and much valuable data compiled from them. Mr. J. S. Hart, M.A., B.Sc., criticised with some force some of the principles laid down in the paper.

Mr. H. Kendall then read a paper, contributed by a member of the club, on "A Western Forest." Reference was made to the tropical forests of Northern Queensland, and the Victorian forests, with their giant gums and fern-tree gullies, as compared with the "light, buoyant, and balmy" forests of West Australia. Spring-time was the season chosen for review, and graphic descriptions

were given of the different species of Acacia, the flowers of which varied from "pale canary colour to soft, rich chrome;" the Scarlet-flowering Gum, whose habitat is confined to a narrow strip of the forest lands along the southern coast; shrubs of the Boronia 10 ft. high; patches of the Bottle-brush shrub, the flowers of which at seasons yield a nectar which proves intoxicating to the honey-eating birds which regale themselves upon it; a virgin Karri forest, individual trees of which reach a height of 250 ft. to 400 ft., whilst an average height of 200 ft. is attained. A hundred other beauties of the forest were described in poetic language, the effect of which was only marred by the lateness of the hour at which the paper was read.

#### NATURAL HISTORY NOTES.

Natural history notes were given in by Rev. E. H. Hennell, on "The Rosella Parrot;" Mr. C. French, jun., on "The Trade in Kangaroo Skins;" Mr. T. Steel, on "The Charms of the Cicadas;" Mr. J. Shephard, on "Zoology in the Streets;" and Mr. G. Renner, on "Earthworms as Fertilizers of the Soil."

Owing to the success which attended the exhibition of wild flowers and grasses last month, the committee again solicited exhibits, with very satisfactory results, the following being the principal exhibitors:—Miss Cochrane, Miss A. E. Roberts, Miss Henley, Baron von Mueller, and Messrs. J. E. Dixon, C. D'Alton, G. Coghill, J. G. Luehmann, and W. H. Wooster. Mr. C. French, sen., exhibited some British Sphingidæ; C. French, jun., eggs of the Straw-necked Ibis, from Swan Hill; and Mr. H. Hill, a case of Victorian Lepidoptera. Baron von Mueller also exhibited the following plants new to science:—*Hypoestes moschata*, collected near Port Darwin—Mr. Holtze; *Glossogyne orthochæta*, Coen River, Queensland—Johnson; *Garcinia warrenii*, Coen River, Queensland—Johnson; *Peperomia enervis*, Mt. Bartle Frere—St. Johnson; also *Thelymitra*, sp., from Youndegin, Western Australia; and rare orchid, *Caladenia congesta*, from near Dandenong Creek—Miss Cochrane. Further, *Coprosma*, from the highlands of New Guinea, accompanied by a *Geranium* and an *Hydrocotyle*.

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#### PRIZE COMPETITION FOR NATURAL HISTORY SPECIMENS.

WITH a view to the encouragement of the study of Natural History amongst the younger members of the community, the Field Naturalists' Club proposes to offer prizes for the best collections of Natural History specimens according to the schedule and conditions set forth below. These prizes will be awarded at

the annual conversazione of the Club, to be held in April or May next.

#### SCHEDEULE.

##### ZOOLOGY.

###### Class

- 1. Reptilia (*snakes and lizards*)
- 2. Mollusca (*land, freshwater and marine shells, &c.*)
- 3. Lepidoptera (*butterflies and moths*)
- 4. Coleoptera (*beetles*)
- 5. Other orders (*wasps, bees, ants, dragon flies, &c.*)
- 6. Best collection illustrating the different orders of Insects
- 7. Best collection illustrating the life-history of Insects.

} Entomology.

##### BOTANY.

- 8. Best collection of flowering plants
- 9. Best collection of ferns, mosses, and fungi
- 10. Best collection of algae
- 11. Best general collection of botanical specimens.

##### GEOLOGY AND PALÆONTOLOGY.

- 12. Best collection of rocks and minerals
- 13. Best collection of fossils.

#### CONDITIONS.

- 1. All exhibits must have been collected in Victoria by the exhibitor.
- 2. The age of the exhibitor must not exceed 18 years.
- 3. No specimen will be admitted which has passed through the hands of a dealer, but ordinary exchange between amateurs is permitted.
- 4. All intending competitors must forward their names and addresses to the Hon. Secretaries not later than 14th February, 1892, that they may be notified as to the latest date on which collections will be received.
- 5. A written declaration from parent or guardian that the competitor has complied with the foregoing conditions must accompany each collection.

N.B.—All collections will be returned to competitors on payment of carriage.

#### EXCURSION TO SASSAFRAS GULLY ON 3RD NOVEMBER, 1891.

THE brightest of spring mornings greeted our party as we alighted at Bayswater station from the train leaving Prince's Bridge at 7.20 a.m.

Conveyances were in attendance to carry the party to Hazel Dell; but accomodation for twenty only having been arranged for, and over thirty, exclusive of Rev. J. J. Halley's party, who brought their own trap, being present, a seat for everyone could not be managed, thus about five or six members had to walk all the way.

Our coach terminus was reached in something like an hour and a quarter, and what some members were pleased to call breakfast was at once attended to, after a first-class appetizer in the

shape of the ride from Bayswater station to the breakfast table, which was situated at an altitude of 930 feet above sea level.

While breakfast was being despatched those who were obliged to walk came up, and at about 12.20 p.m. a start was made for the gully. From Hazel Dell to the entrance of the gully is an ascent of 570 feet, making the total height 1,500 feet. In some places the walk proved a little heavy, particularly for those who had come on foot all the way from Bayswater. Half-way up, a short rest was much enjoyed, and on resuming, the summit of the hill was soon reached. Descending into the gully our party split up into sections, and at no period of the day were we all together again.

The gully was traversed as far as the site of the hut being erected by Mr. G. S. Perrin, F.L.S., by about half the party, the remainder preferring to confine their attention to small portions and examine them thoroughly, and using the Hatter's Hut, of which a photograph has previously been exhibited, as their headquarters. On the return of the party who had proceeded further down, this section were found busy turning over pie crusts, &c., in search of something more enticing than is usually found under rotten logs.

Bird life seemed even scarcer in the gully than when previously visited, and those who hoped to secure a nest or two were sadly disappointed, not a single one having been observed by any of the party. A Yellow-breasted Robin (*Eopsaltria australis*) was observed feeding one of its young, which must have quite recently left the nest, as it remained perched on the branch until taken by hand; not being required as a specimen, it was soon restored to liberty. The only birds taken were Pennant's Parrakeet (*Platycercus pennantii*) and a Sacred Halcyon (*Halcyon sanctus*).

Several members of the party, including Messrs. E. H. Hennell, J. Shephard, and Rev. W. Fielder, who devoted some time to the unearthing of some species of cryptozoic fauna, report the capture of the following specimens:—One Peripatus (*P. insignis*), several Nemertines (*Geonemertes australiensis*), and ten species of Planarians (*Geoplana sugdeni*, *G. mediolineata*, *G. alba*, *G. munda*, *G. hoggii*, *G. sulphurea*, *G. adæ*, *G. howittii*, *G. macmahoni*, *G. ventropunctata*).

Although the day was an exceedingly fine one, we were not very fortunate with insects, the wet and cold weather of the preceding days having either retarded their emergence from the pupa state or destroyed them.

On the gum saplings nothing was to be found but a few of the common Chrysomelidæ, or Ladybirds, genus Paropsis, and these being obtainable through many months of the year, their liberty was on this occasion not interfered with. In the swampy grounds bordering the roads, there was plenty of *Leptospermum* and

Melaleuca in flower, and both were submitted to a thoroughly good examination by means of the ever-useful umbrella, but the only beetle of note was the pretty little yellow and blue Longicorn, *Eorinus mimula*, of which several specimens were secured. Of course we also saw numbers of those too common buprestis beetles, *Stigmodera praeocularia* and *S. octosignata*, but these, strange to say, were not accompanied, as they nearly always are, by several other species of the same genus. A fortnight later we think this would be a good collecting locality, and would well repay a visit; the Leptospermum in flower would then not be quite so plentiful, and there is often more success derivable from examining comparatively isolated small patches of it. Lepidoptera were also scarce, if we except the smaller moths, as other than these the only ones we observed were *Papilio macleayanus*, two specimens; *Epinephile abeona*, four specimens; and *Pyrameis kershawi* and *P. itea*; also two species of Agarista.

As the excursion was intended especially for Sassafras Gully, which by the way was thought exceedingly beautiful, our time for collecting along the road was limited, and in the gully itself it is almost needless to say that neither umbrella or net were required, most insect life preferring the more open timber or heathy country.

Flowering plants are generally not numerous, nor in such great variety, in fern gullies as in more open country, and are mostly in bloom later in the season.

Along the way to the gully, however, a good many presented themselves. Foremost amongst these may be mentioned the beautiful *Clematis aristata*, hanging in graceful festoons from some of the fences and hedges; the lovely *Comesperma ericinum* was making its appearance, as well as *Erythrea australis*. In contrast with their pink and red flowers might be observed the yellow blossoms of *Dillwynia ericifolia* and *Pultenaea gunnii*, while the flowers of *Acacia mollissima* filled the air with their sweet perfume, but other congeners were already in fruit. Our two common species of *Viola* were very plentiful, as was also the small euphorbiaceous plant, *Poranthera microphylla*; *Hypericum japonicum*, *Stackhousia linearifolia*, and *Lobelia pratoides* were not rare. The tiny *Drosera pygmaea* was seen in some patches, its larger congener, *D. auriculata*, very abundant. *Hydrocotyle laxiflora* might be observed in grassy places, *H. geranifolia* being confined to the gullies. Of orchids, only *Diuris maculata*, *Microtis porrifolia*, *Caladenia carneae*, *Thelymitra ixioides*, *Chiloglottis gunnii*, were observed, the latter just coming into flower on the trunks of fern trees. Some of the latter also supported flowering plants of *Fieldia australis*, as also *Zieria smithii*; *Hedycarya cunninghamii* and *Atherosperma moschatum*, the Sassafras, were not seen in flower.

Among the plants growing near the station may be mentioned *Patersonia glauca* and *P. longiscapa*, *Bulbine bulbosa*, *Cæsia vittata*, *Thysanotus tuberosus*, *Xerotes thunbergi*, *Xerotes longifolia*, and the odd-looking *Xanthorrhœa minor*.

In the gully itself all the usual kinds of ferns were of course to be seen, but the very slender tree fern, *Cyathea cunninghami*, was not found. The stumpy *Todea barbara* has here much longer fronds and of a more glossy green than in more open country. A goodly number of the lower cryptogams were observed, among them several species of Hepaticæ in fruit, and also the splendid moss, *Dawsonia superba*.

The return journey was commenced from Hazel Dell at 4.30 p.m., and during the drive back to Bayswater the only regrettable incident of the day occurred. From the Forest Road terminus of the coach to Hazel Dell a road is cut of a winding character along the side of the hill, and in some parts is a little steep. Coming down such a road of course necessitates careful driving. It so happened that the driver of the second coach, which was one of the old pattern mail coaches on leather swings, drove very erratically, and when about half-way down the track collided with a log and turned the coach completely over on its side. The occupants, chiefly ladies, were got out as speedily as possible and the coach righted. It is a matter for congratulation, that though the ladies were severely shaken, no one was seriously hurt. With one or two exceptions, by the generous assistance of some gentlemen who were driving behind us, we reached Bayswater in time to catch our train at 5.51 p.m., by which most of the party returned to town, having, as far as weather was concerned, had a perfectly lovely day, and which but for the accident alluded to might be said to have been thoroughly enjoyed by all.

R. S. SUGARS.

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#### PHENOLOGY AND RURAL BIOLOGY.

BY MR. J. E. PRINCE.

(*Read before the Field Naturalists' Club of Victoria, 16th November, 1891.*)

AN eminent English botanist, in a recent magazine article, said he was sometimes asked how he became a botanist. In reply he stated he hardly knew, unless I say with Topsy, "I 'spect I growed." I don't know the date of my conversion. It was not at any rate a sudden, violent convulsion, such as we may suppose a geologist might experience; it was a slow and gradual process, in keeping with the science of "first the blade, then the ear, and then the full corn in the ear." It is the observation and record-

ing of facts regarding the principal phases of the life-history of plants, insects, and birds of which my paper treats this evening.

To meteorologists, medical men, and others interested in sanitary questions and health resorts, such observations, when collected, form, in the course of a few years, a standard of the climate and vegetation with which to compare local variations. To scientific naturalists, agriculturists, and horticulturists, it shows the relations which exist between meteorological and organic phenomena, and their dependence on each other.

The study of natural history has altered much both in character and methods in recent years. Botany and the other branches of natural science no longer consist of the mere collecting, preserving, classifying, and naming—the indexing, so to speak—of natural objects ; but in observing the development, life-history, and periodical phenomena of such objects, their modifications under natural and artificial conditions, and the relations they bear to each other and to the pleasures and wants of mankind. The analytical methods of studying natural history are giving place to synthetical, and, instead of pulling plants in pieces, and anatomizing animals to ascertain their minute physical differences, attention is being directed to their relationship to each other, and to forces and agencies by which living things are developed, built up, preserved, and reproduced.

Of the many attractions of rural life—and, to a certain extent, of urban and suburban life also—none are more interesting and instructive, nor more frequently the subject of observation and record, than the periodic phenomena associated with plants and animals ; and to persons engaged in rural occupations, none are of greater importance, nor the source of so much anxiety. The germination of seeds, the leafing, blossoming, ripening of fruit and seeds, and the fall of the leaves of plants and trees ; the migration, song, and nesting of birds ; the appearance of insects and their larvæ ; the habits and instincts of animals, &c., are all phenomena of this kind ; and, being dependent on seasonal and meteorological conditions, are largely correlated or dependent on each other, and to be properly understood must be studied together. Such observations are known to meteorologists and botanists as phenological observations, and have been made for many years past in England and the Continent, and in this colony in 1856 by our worthy patron, Baron von Mueller, but discontinued owing to his other appointments ; and latterly, about nine or ten years ago, by others. These being so spasmodic gave their records little value for average comparison.

The scientific value of such observations depends on the care with which they have been made, and on the value which is to be attached to averages of observation extending over a period of twenty years.

To persons engaged in country occupations, whether for profit or pleasure, a systematic study of the phases of vegetable and animal life is of the greatest interest and importance. The character of soils, as well as climates, is best judged by their vegetable products, and the periods at which grasses, plants, and trees blossom and attain maturity. Not only has each district, but each farm, and often each field or garden, a character of its own ; and it is only by observing, recording, and comparing with some ascertained standard the specific products of each locality that their peculiarities can be determined and turned to profitable account. It is well known, for instance, that one field will grow clover, and another will not ; that one pasture will fatten sheep quickly, while another will do so slowly ; and a good deal of what is called *practical farming* consists in remembering facts of this kind and taking advantage of them ; or, as is too often the case, in ignoring or forgetting them, to the certain loss and disappointment of the farmer. Peculiarities of this kind, although remotely due to the soil and climate, are really peculiarities of vegetation, and should be studied and recorded in a systematic manner to be properly understood and utilized. A very good instance of these remarks is at present being brought prominently before us—viz., the Mallee Lessee question—where one of our number, Mr. J. Bosisto, appeared to give evidence, and proved that failure by the farmer was due to the want of knowledge that the scrub burnt and its ashes judiciously returned to the soil as manure keeps it prolific for years.

Again, the ravages of insects and their larvae are of the most serious import to all persons interested in the cultivation of the soil, whether it be farming, gardening, or forestry ; and it is only by observing and recording the earliest time of the appearance of such insects that preventive measures can be adopted with any prospects of success.

The subjects of observation should be more particularly in the direction of the first blossoming of plants, the first appearance of butterflies and moths, and the migration and nesting of birds ; on the ripening of fruits and seeds and their time of harvesting, or the survival and second blossoming of plants and trees at unusual seasons, and on the falling of the leaves as indicating the ripening of buds and the prospect of future fruit crops. Further observations are also required on the casual appearance of insects, the migration of birds in winter, and the hibernation and other phenomena of animal life, &c.

Many persons will probably not have the time or the inclination to devote their attention to all the subjects of inquiry ; but the specialist who confines his labours to one or two sections cannot fail to be interested in the correlative phenomena, and

thus gain a wider view of the significance of his favourite branch of study.

In consultation with Baron von Mueller regarding the plants of the months, none have yet been compiled of our flora ; in fact, it is impossible, since the seasons merge so into each other. Our earliest flowering plants are — *Wurmbea dioica*, the *Droseras*, *Acacia dealbata*, *A. pycnantha*, *A. mollissima*. A list of calendar plants is to be found in the "Select Plants;" these are just the genera from the economic section. The last flower of the season is *Eriochilus autumnalis*; the flowering season being from 1st April to 31st March.

Such observations would be useful in exciting an interest in natural science among the young, as they would form matter for recording the birthdays of flowers, butterflies, and birds, and with which children may compare their own birthdays and those of their friends. For natural history classes in schools it will supply lists of objects to be sought for on country walks and excursions at the proper seasons, and it will furnish special and appropriate subjects for teachers and lectures to explain at the proper seasons.

#### PERIODICITY IN NATURAL PHENOMENA.

We are accustomed to divide the year into four seasons—spring, summer, autumn, and winter ; but in Australia Nature divides it into three, and she shows a disposition to contract the three into two as we proceed south or north of the tropics. The natural seasons are chiefly the result of variations in the heat and light of the sun's rays, while in the tropics moisture plays the principal part ; hence we have in the former warm and cold seasons, and in the latter wet and dry seasons.

The three seasons of organic objects are :—(1) The season of growth, or its correlative reproduction ; (2) the season of maturation (*i.e.*, the ripening of fruits and seeds, and buds of vegetables, and the consolidation and fattening of animals) ; and (3) the season of rest or equilibrium of the two former conditions (*i.e.*, the defoliation of trees, and, in extreme cases, hibernation of animals). The natural seasons are most distinctly marked the lower we go in the organic scale, but they are more or less distinguishable throughout the vegetable and animal kingdom. The range of seasons varies with different species of plants, and they are further modified by various natural and artificial conditions, our climate being such that plants may be seen in flower all the year round. Cultivation, with its numerous appliances for modifying the physical conditions of temperature, moisture, and soil, tends to a hastening or shortening of the earlier seasons —hence cultivated plants generally blossom and fruit earlier than wild ones of the same species ; and some meteorological conditions, such as high temperature and droughts, if they do not

suspend vegetation altogether, shorten the period of growth and hasten that of maturation, and sometimes give rise to the exceptional phenomena of the second leafing and blossoming of plants and trees in the same year. The order of the seasons differs with the relative length of the day and night. Growth in length or bulk of vegetables takes place in the dark, while maturation of structures and juices takes place in the light. Hence the plants of alpine regions are dwarfed by the short, cold nights, and hastily matured. In the tropics, where the days and nights are of nearly equal length and the temperature is always favourable, growth is almost continuous (hence an excess of leaves over flowers), and is interrupted only by a lack of moisture.

The season of maturation is most distinctly displayed by the ripening of fruits and seeds; but it equally applies to the ripening of the buds, roots and tubers of perennial trees and plants which cast their leaves or die down.

The season of rest is less marked than in Europe, our indigenous vegetation being evergreen; our principal trees, being the eucalypts and the acacias, cast their bark annually; but this does not take place, like the falling leaf in England, at one given period of the year.

The threefold divisions of the seasons is distinguished among insects by the three stages of their life-history—the perfect insect, the caterpillar, and the chrysalis. Some insects in the perfect form are said to hibernate through the winter, but this is probably only a condition of the survival of a few individuals under favourable conditions. Among birds we find the threefold seasons by the nesting, maturation, by fattening of both young and parent birds, and rest by migration.

#### CLIMATE.

For determining the climate of a country, a district, or a health resort, no method is so interesting and satisfactory, and at the same time so easily carried out, as recording the condition of vegetation at different seasons of the year. Meteorological observations, made by means of instruments, require an amount of skill, time, and perseverance which many persons do not possess, and, at best, such observations are open to many sources of error from the liability of the instruments to get out of order, and from other causes; and they are, to the majority of persons, singularly wanting in passing interest. The interpretation, moreover, of such observations is often difficult and unsatisfactory, as differences of climate are due to subtle combinations of sunshine, rain, wind, and soil, which no instrument can record nor figures represent, and which are only truly declared by the varying conditions of vegetation, and remotely by the insects which feed on it, and

by birds and animals which feed on both, and are themselves influenced by such conditions. A perusal of the town and country papers cannot but impress the most casual observer that the people in the country attach considerable importance to the early and late blossoming of plants, conditions of crops and orchards, the times and appearances of insects, especially those classed as pests to agriculture and horticulture, and the migration of birds, especially those protected by the Game Act, as witness the recent press discussion on the wild duck. All these show that the public taste is more in sympathy with biological than physical data regarding the methods of distinguishing climate and the advantages thereof. On the other hand, writers on climatology do not recognize its importance, but trust too implicitly to mere averages of meteorological data, forgetting that similar averages may result from very different ranges of climatic conditions. It is the extremes of temperature, moisture, &c., which determine the character of the vegetation of a locality or district, and these are also the conditions which determine the character of a health resort.

Plants and trees, moreover, may be looked on as natural registering "weather-glasses" of different degrees of sensibility. Some botanists assert that what may be termed the zero, or stationary condition, of vegetation is at 6 deg. C. (about 42 deg. F.) and that the various phases of plant life depend on the accumulated heat to which they are exposed; and many observations and calculations have been made with the object of testing the truth of this theory, especially on plants which are of economic importance. The Government Astronomer informs me that our zero would be 3 deg. F. higher than Europe, or 45 deg. F., as the standard. In this way the temperature equivalent of our flora can be determined, and also, in a less definite way, their moisture equivalent. The reverse of this is also true. The blossoming of the various plants indicates the existence of their temperature and moisture equivalents—facts of extreme interest to farmers and gardeners as well as to meteorologists, which would be greatly enhanced in value if we were able to possess a similar set of observations on the germination of seeds and the ripening of fruits and seeds.

For observation the best scheme to be adopted would be to follow that admirably laid out by the Government Botanist in the "Key to Victorian Plants," part 2. Taking them in their order as laid down by him we have:—The north-western region, from the sources of the watercourses in the north-west to the River Murray, which includes Echuca, Kerang, Swan Hill, the valley of the Glenorchy, and Mildura. In the south-west region, from the sources of the watercourses in the south-west to the coast west of Cape Otway, and to the vicinity of the Glenelg River, we

have Portland and Hamilton. In the south region, from the sources of watercourses in the south to the vicinity of Cape Otway and to Port Phillip and the western boundary of Gippsland, Melbourne district, Geelong, Ballarat, Bacchus Marsh, Myrniong. In the north-east region, from the sources of the watercourses of the north-east to the Hume River, including the whole of the Victorian Alps, Marlow, Cunningham, or Lakes Entrance, Bruthen, Bairnsdale, Sale. With regard to this district, I may point out, in passing, that the Lakes Entrance is worthy of note from its value as a health resort, the climate being of a sub-tropical nature, unlike any other coast town of Victoria. The eastern region comprises Gippsland (exclusive of the Alps), Omeo, Bright, Beechworth.

#### INSECT PESTS.

A careful and systematic inquiry into the food-plants of the larvæ of different genera of butterflies and moths is desirable, and it will probably be found that each genus, although able to survive on many different kinds of plants, is identified with certain natural orders—*i.e.*, *Pieris* with *Cruciferae*, *Argynnis* with *Violaceæ*, *Vanessa* with *Urticaceæ*, or with orders which stand nearest to them. The key of this line of investigation will probably be found in the relation which the mature insects bear to the colour, shape, and other characters of the flower, &c., of the plants and trees on which their larvæ feed, as they are generally found in the neighbourhood of such plants. Probably some of our entomologists could supply sufficient information to compile a list to assist further observation.

#### MIGRATION OF BIRDS.

The migration of birds is chiefly a question of food supply, and it is, therefore, correlated to insect and vegetable life, and through them meteorological conditions. It is not peculiar to either hemisphere, and has no necessary relation to the physical disposition of land and water. It is not confined to any family of birds, nor are all the individuals of one species migratory or non-migratory. Probably some of our ornithologists could draw out a scheme schedule of our native birds for observation on the same system as in Europe—say, the birds protected under the Game Act—and separating the insectivorous from those destructive. Much good has already been done in this way by the “Handbook” issued by the Government Entomologist; and I note with satisfaction that our laws are more severe than those of England as regards penalties, they being exactly double, but it is the want of inspectors to carry out the Act that makes it inoperative.

An interesting point to notice is, if our birds, in their migration, follow the lines which Mr. Seeböhm tells us are followed in Europe, those who migrate in summer starting with a favourable wind

—the birds preferring what is called a beam wind, and for which they may wait many days; and the moment it arrives, with a common impulse, they will start on their journey. True, migratory birds usually depart in the following order, but they do not invariably travel in flocks:—The lead is taken in the first week by all the spring birds; in the second week the males follow; in the third week the females, the last being formed of the maimed and crippled birds. Closely connected with the subject of migration, and equally deserving of systematic observation, is the congregation or flocking of birds in the autumn and winter months, and it is probably correlated with fishes and reptiles.

With the scheme of meteorological observations universally adopted I need not take up the time of the club, as that is so ably done by the Government Astronomer, and leaves the time of all who take up the scheme as a study to collect the data accurately. In consultation with Mr. Ellery on the subject, he promised to assist the club with what data they may require; and as previous phenological reports have been published by the Astronomer's department, I have no doubt he would be pleased to do the same again.

All the club would have to do would be to obtain a few members in each district, as before mentioned, skilled in the various departments under review; and the work might greatly be assisted by the co-operation of the field clubs at Ballarat, Geelong, and Sandhurst, and any other centres that may be thought desirable. Approved schedules for the work have been drawn out, and, with postages, would not cost more than about £5 per annum at the most. In carrying out this the club would only be doing that which Baron von Mueller has desired and pointed out as of great value (see the introduction to the "Key to Victorian Plants," part ii.); and it would be also some recognition to the Government for the many favours received from it.

In conclusion, let me sum up the advantages of carrying out the scheme. Firstly—As regards plants, the club would know the earliest flowering dates for the various districts, and from a few seasons' data a proper table of places to visit for excursions would be obtained, which would give more certainty than at present exists that such would not be fruitless. Secondly—with regard to insects, accurate data would be recorded, which, in conjunction with the meteorological at hand, could then be probably anticipated, and preventive measures adopted in time before much destruction to crops had taken place. Thirdly—Proper attention to the nesting, song, and migration of our native birds would, in time, lead to a proper estimate of the close seasons that should be adopted for the various localities of the colony for their protection. As the present Act stands, it is the same for the whole colony; the English Act provides for the variety of climate.

Lastly, and most important to the club, it would form a bond of union of the various sections of the Club, and also a link of affiliation with the various clubs in the country, and would extend the influence and circulation of the Club and its journal.

I have to acknowledge my indebtedness for much valuable information, in the preparation of this paper, to Mr. Roberts's "Naturalist's Diary," the text-book of naturalists in England, Professor Henslow, and others, including particularly the Government Botanist and Astronomer, for the data suitable to this country.

#### CORRESPONDENCE.

##### PROTECTION OF NATIVE BIRDS.

[The following letter from Sir George Verdon has been forwarded to us by Baron von Mueller for publication.—ED.]

MY DEAR BARON,—Will you permit me to express my great satisfaction that you are giving your valuable aid and influence to the protection of the insectivorous birds? The magpies in the Macedon district have been nearly exterminated by the poisoned wheat laid down for rabbits. It is quite useless there for that purpose; but it has killed a vast number of the native birds, which do far more good in destroying insects than the rabbits do harm. It may be of use to you to know this; and so I trouble you with the information.

Dr. Plummer, of Gisborne, informs me that, near his house, he found fifteen magpies dead in 150 yards.—I am always, my dear Baron, yours most sincerely,

GEORGE VERDON.

Melbourne Club, 24th November, 1891.

##### NOTES ON CUCKOOS.

*To the Editor of the Victorian Naturalist.*

SIR,—A friend of mine, living near Oakleigh, informs me that one day, when out collecting, he came across a nest of the White-eared Honey-eater (*Ptilotus leucotis*) ready for eggs, and on visiting the same nest the following day, it contained an egg of the Pallid Cuckoo (*Cacomantis pallidus*), which he left, thinking the Honey-eater would lay shortly; but on his return the third day, he found that the egg of the Pallid Cuckoo had been thrown out of the nest by the Fantail Cuckoo (*Cacomantis flabelliformis*), and she had laid an egg in the nest. The Honey-eater deserted the nest. This is the second time my friend has noticed this same proceeding.

C. FRENCH, JUN.

South Yarra, 24th November, 1891.

THE ROSELLA PARROT.—“A Native,” writing from Skipton, says:—“I found yesterday in the Western District of Victoria what I consider a remarkable nesting-place for a Rosella Parrot. While riding through thickly-timbered country I was surprised to see a Rosella fly out of a rabbit’s burrow, and on digging it out I was still more surprised to find five eggs at the end, two feet from the mouth. I will be glad if you will insert this, as it may be of interest to some of your naturalist readers.”—*Australasian*.

THE TRADE IN KANGAROO SKINS.—Representations have been addressed to the Premier regarding the wholesale destruction of wild animals and birds. Kangaroos and Lyre Birds are so much sought after that at the present rate of destruction their extinction is only a question of time. For the last three years the value of the Kangaroo skins exported to the United States totalled £300,000, or £100,000 per year. ONE AGENT ALONE IN A SINGLE FORTNIGHT RECENTLY EXPORTED 1,600 LYRE BIRDS’ TAILS TO THE UNITED STATES. The Premier is considering the question with a view to prevent wanton destruction.—*Age*, 15th October, 1891.

THE WORK OF EARTHWORMS.—Mr. G. Renner calls attention to some experiments recently made by Dr. Wollny, of Munich. A number of pots were placed in such a manner as to allow all plants grown in them to vegetate under similar conditions. Half of the pots received soil inhabited by earthworms; the soil of the other half was kept free from worms. Beans, peas, oats, rye, and other economic plants were sown in the pots, and their development carefully watched. Already, when germinating, the plants in the soil containing worms proved, by their vigorous growth, that they “had the best of it,” and the results may be stated thus:—They produced more than the plants in soil not containing worms—in the case of peas, 24·1 per cent.; rye, 59·9 per cent.; beans, 81·7 per cent.; rape, 231·7 per cent. If we look for the reasons for the better development of the plants in the “infested” soil, we find that the worms dig and loosen the soil in such a manner as to make it more porous, hence the quantity of water which the soil can bind must decrease, the quantity of air must increase—to use a technical term, the soil becomes specifically “warmer.” This favours a ready decomposition of the nutritive substances, and the plants are benefited; whereas moist soil becomes sour. In the soil where decomposition takes place unimpeded, carbonic acid is developed in large quantities, which in its turn readily dissolves the mineral substances or nutritive salts contained in the soil. May we not therefore conclude that, in order to improve the permanently moist soil where nothing but reeds, rushes, and cyperaceous plants will grow, earthworms should be settled, which will, it cannot be doubted, soon drain the land and thereby prepare it for the reception of more useful plants?

# Field Naturalists' Club of Victoria.

President:

PROFESSOR W. BALDWIN SPENCER, M.A.

THIS Club was founded in 1880 for the purpose of affording observers and lovers of Natural History regular and frequent opportunities for discussing those special subjects in which they are mutually interested; for the Exhibition of Specimens; and for promoting Observations in the Field by means of Excursions to various collecting grounds around the Metropolis.

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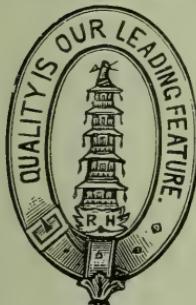
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VOL. VIII.—No. 9.

Royal Society  
JANUARY 1892.  
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# The Victorian Naturalist:

THE JOURNAL AND MAGAZINE

— OF —

The Field Naturalists' Club of Victoria.

PUBLISHED JAN. 4, 1892.

Editor: A. H. S. LUCAS, M.A., B.Sc.

The Author of each article is responsible for the facts and opinions he records.

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THE  
*Victorian Naturalist.*

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VOL. VIII.—No. 9. JANUARY, 1892.

No. 97.

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FIELD NATURALISTS' CLUB OF VICTORIA.

THE ordinary monthly meeting of the Club was held in the Royal Society's Hall on Monday evening, 14th December. The President (Professor W. Baldwin Spencer) was in the chair, and there were about 60 members and friends present.

LIBRARIAN'S REPORT, NOVEMBER AND DECEMBER, 1891.

The hon. librarian reported the receipt of the following donations to the library:—"Records of the Australian Museum," vol. i., No. 9, from the Trustees; "Proceedings Linnean Society of New South Wales," second series, vol. vi., part 4, from the Society; "Journal of Bombay Natural History Society," vol. vi., part 2, from the Society; "Journal of Brunswick (Germany) Natural History Society" for 1887-8, 1888-9, from Society; and "Journal of Pharmacy," October, 1891; "Annual Progress Report, State Forest Department, New South Wales," 1890, from the Department; "Report of Trustees Australian Museum, Sydney," 1890, from the Trustees; "Journal of Pharmacy," November, 1891.

ELECTION OF MEMBERS.

A ballot for new members then took place, and resulted in the election of Messrs. W. H. Archer, F.L.S., A. G. S. Robertson, C. Ryan, and F. W. Ward, whilst four others were nominated for election at the next meeting.

REPORTS OF RECENT EXCURSIONS.

The leader (Mr. F. G. A. Barnard) reported that the excursion to Ringwood on Saturday, 17th October, was fairly attended, considering the showery weather, and much enjoyed by those present. The country to the north of the station was visited, and a large number of flowers collected, some 18 species of orchids being noted, among which may be mentioned *Prasophyllum elatum*, *Pterostylis barbata*, *Calochilus campestris* and *Caladenia suaveolens*; *Limnanthemum exaltatum*, *Comesperma ericinum*, *Polypompholyx tenella*, *Phylloglossum drummondii*, and other plants were also noted. Few insects were seen, the day being somewhat unfavourable, though one or two buprestid beetles were taken.

The leader (Mr. F. G. A. Barnard) reported that the excursion to Willsmere (Kew) on Saturday, 21st November, was fairly attended, considering the threatening weather, eight members being present. The ponds were found to be too full of water for much collecting to be done ; however, one of the party secured eight species of Ostracoda, six belonging to genus *Cypris* and two to genus *Candona*. Few insects or plants of note were seen. It was decided to try the locality again when the state of the lagoons would admit of closer search.

#### PAPERS.

No less than four papers were put down for reading at this meeting. Mr. T. S. Hall, M.A., contributed the first, his subject being a "Note on the Glacial Beds near Heathcote." These beds are locally known as the Wild Duck Creek beds, and are best reached from Derrinal railway station. Scattered throughout the beds are masses of rocks of all shapes and sizes, almost all of which are ground and scratched on more than one face. The hills overlooking the creek valley are covered with masses of rocks of various kinds, and these also bear evidence of ice action, either as striations or as well-ground facets. Mr. T. S. Hart, B.A., referred to similar characteristics in a deposit near Ingliston, whilst Mr. G. Sweet exhibited some striated pebbles, probably glaciated, from the heights of Myrniong, near Bacchus Marsh, as also a glaciated pebble from the ancient glacier whose course was that of the present Lake Wakatipu, New Zealand, for comparison with it. Mr. T. Steel, F.C.S., regretted that the writer had not recorded any evidence of organic life in the deposit.

Mr. A. J. Campbell, F.L.S., then brought up a note on "A Veritable Nest and Egg of a Bird of Paradise" (*Ptilorhynchus victoriae*). Eastern Australia possesses a genus (three species) of these beautiful birds, which are known to us as Rifle Birds. Owing to their retiring character and the restricted area of their distribution the birds are very seldom seen ; much interest, therefore, attached to the note, which narrated the finding of the nest and egg of one of the species by Mr. Dudley Le Souëf in a late visit to the North Barnard Islands, about forty miles off the coast from Cardwell (Queensland).

A paper by Mr. G. Renner on "A Review of Dr. Volger's Spring Theory" followed. This theory asserts that the deeply seated springs are not fed by rain water which gradually sinks down to their level, but are produced and supported by the condensation of aqueous vapour which is deposited during the passage of the atmosphere through the various strata of which the upper portion of the earth's crust is composed. Hence it follows that deeply seated spring water is the best for consumption, since it has not been contaminated by the various organic substances,

which is generally the case with the ordinary surface water. In the discussion which followed the consensus of opinion was that the theory had nothing to recommend it but its originality.

The last paper was read by Mr. Dudley Le Souëf, who gave an account of a recent "Trip to Queensland." The paper, which took some forty minutes to read, literally bristled with facts of more or less interest to naturalists, and could only have been written by one who possesses the instinct and power of observation of a true naturalist. The greatest prize taken on the trip was the nest and egg of the Victoria Rifle Bird, a full description of which will be found on a later page, as well as the circumstances under which it was obtained.

#### EXHIBITION OF SPECIMENS.

The following is a list of the exhibits with which the meeting terminated :—By Mr. G. Coghill.—*Vallisneria spiralis*. By Mr. A. Coles.—A Bearded Swift and a parrot (supposed to be the smallest parrot in the world, measuring only  $2\frac{3}{4}$  inches long), both from New Britain; also a Hoopoe, a Jay, and a Cock of the Rock. By Mr. J. E. Dixon.—Large specimens of *Drosera binata*, from Cheltenham; also Coleoptera collected at Dandenong Creek, Oakleigh, &c., By Mr. C. French, sen.—Lepidoptera (Rhopalocera and Heterocera) from British Honduras. By Mr. C. French, jun.—Three nests containing eggs of the White-throated Thickhead (*Pachycephala gutturalis*), showing the variation in the colour of the eggs collected at Bacchus Marsh, Oakleigh, and Dandenong Ranges; also rare orchid in flower (*Orthoceras strictum*), collected in December at Cheltenham. By Mr. J. Gabriel.—Ringed Water Snake from Fiji. By Mr. G. A. Keartland.—Pair of Blue-tongued Lizards (*Cyclodus gigas*), taken at South Brighton. By Mr. J. A. Kershaw.—Eggs of *Phaeton rubricauda* (Bodd.), Red-tailed Tropic Bird, from Lord Howe Island; *Recurvirostra rubricollis* (Temm.), Red-necked Avocet, from Yandembah, New South Wales; *Pelecanus conspicillatus* (Temm.), Australian Pelican, from Gippsland Lakes; *Menura alberti* (Gould), Prince Albert's Lyre Bird, from New South Wales; *Ardetta minuta* (Linn.), Minute Bittern, from Murray River, Victoria; also skin of the latter bird. By Baron von Mueller.—*Swainsona cyclocarpa*, Macdonnell Ranges, Rev. W. F. Schwarz (new to science); *S. forresti*, West Australia, Hon. J. Forrest (new to science); *S. monticola*, Wangaratta, Miss Henley (new for Victoria); *Bauhinia holtzei*, Port Darwin, N. Holtze (new to science); *Aeschynomene aspera*, var. *oligartha*, Port Darwin, N. Holtze (new for Australia); *Caleya minor*, Grampians, C. Frost (new for Victoria); also "Monography of Australian Characeæ," by Dr. Norstedt, of Sund, Sweden. By Mr. J. Searle.—Orchid

(*Caleya minor*), new for Victoria. By Mr. D. Le Souëf.—Nest and egg of Rifle Bird (*Ptilorhis Victoriae*), birds' eggs, shells, and many specimens, in illustration of paper. By Mr. T. Steel.—Eight species of freshwater Ostracoda, collected at Willesmere. By Mr. G. Sweet.—Pebbles, probably glaciated, from Myrniong; also glaciated pebble from near Lake Wakatipu, New Zealand.

---

### THE WILD FLOWER EXHIBITS.

THE committee of the Club had determined this year not to set apart a special evening for an exhibition of wild flowers, as has been the custom for some years past, but to ask members to contribute exhibits of that class at the monthly meetings in October and November, so that the exhibits might embrace both the early and late spring flowers. The result of this change was entirely satisfactory, and a large display of our native flora, both from the vicinity of Melbourne and the more distant parts of the colony, was made, owing to the energies of the patron of the Club, Baron F. von Mueller, K.C.M.G., Government Botanist, and other members.

The exhibits at the October meeting were the more numerous, and, in fact, exceeded the expectations of the committee, completely filling the smaller room at the Royal Society's Hall, and a portion of the large room. At this meeting Baron F. von Mueller exhibited a large number of flowers, principally from the Beechworth district, containing many handsome species. These were staged in large bunches in ornamental jars, and were aesthetically very effective, though it prevented the naming of individual flowers, as has usually been the plan. The centre table was occupied by Mr. G. Coghill with the results of a special trip to Hall's Gap, in the Grampians, distant some 170 miles from town, where, thanks to the kindness of the Messrs. D'Alton, he succeeded in getting together a splendid collection of wild flowers, the greater number of which were previously unknown to the Club's exhibitions. Among these may be mentioned the lovely Boronias, *B. pinnata* and *B. pilosa*; the rare Eriostemon, *E. hillebrandi*; several Styphelias, including the large red *S. sonderi* and the whitish-fringed *S. adscendens*; *Pultenea scabra*, with its dentated leaves; *Prostanthera rotundifolia*, *Bauera sessiliflora*, *Lhotzkya genetylloides*, *Calycothrix sullivani*, all in large quantities; also, *Eucalyptus alpina*, the pretty *Kunzea parvifolia*, *Thryptomene mitchelliana*; the rather uncommon plants, *Phyllanthus thymoides* and *Pseudanthus ovalifolius*; the curious *Conospermum mitchelli*, with its small white and black flowers. Among the Grevilleas was *G. equifolia*, and amongst the Rhamnaceæ the rare *Cryptandra*

*d'altoni*. In Mr. Coghill's collection from Beaconsfield, Castlemaine, Upper Murray, &c., were the climbers *Tecoma australis* and *Fieldia australis*; the pretty orchid *Caladenia menziesii*; and a small form of the rarer orchid, *Chiloglottis gunnii*, besides many other most interesting flowers. In the larger room Mr. G. Coghill had a number of flowers from the Castlemaine district, among which *Eriostemon obovalis* was most noticeable; also some from the Upper Murray, including *Epacris pallidus*—making up, altogether, a collection of nearly 150 species. Mr. H. T. Tisdall, F.L.S., had a number of flowers from the Eltham district, among which were good specimens of many orchids, *Grevillea rosmarinifolia*, *Viola betonicifolia*, &c. The Misses Taylor exhibited a number of flowers from the Narre Warren district, among which was *Baeckea ericaea*, from a cultivated plant. Messrs. W. F. Gates and E. R. Hammett sent a good collection from Alexandra; Miss Roberts exhibited about fifteen species from around Elsternwick; Mr. E. H. Hennell exhibited a good spray of *Clematis aristata* from a plant grown by him at Ringwood; Mr. W. Scott's exhibit represented to some extent the flora of New South Wales, or rather the vicinity of Sydney, as it included the brilliant Waratah, Boronias, Flannel Flowers, &c.; Mrs. Flatow showed some orchids from Frankston.

At the November meeting, held on the 16th ult., the principal exhibitor was Baron F. von Mueller, K.C.M.G., who had received numerous contributions from various parts of the colony. Among these may be noted *Marianthus bignoniaceus*, *Boronia pilosa*, *B. pinnata*, *Lasiopetalum dasypphyllum*, *Pultenaea rosea*, *Bauera sessiliflora*, *Lhotzkya genetyllloides*, *Melaleuca squamea*, *Pomaderris elachophylla*, *Conospermum mitchelli*, *Grevillea confertifolia*, *G. oleoides*, *Aster asterotrichus*, *Calectasia cyanea*, by Mr. C. D'Alton, from the Grampians; *Pterostylis barbata*, *Caladenia suaveolens*, by Mr. C. Walter, from the Upper Yarra, also *Acacia alpina* from the Buffalo Mts.; *Pultenaea mucronata*, and a beautifully-arranged bouquet of native flowers, by Miss Oke, from the Ovens River; *Pultenaea foliosa*, *Eucalyptus polyanthema*, by Mr. C. Falck, from the Ovens River; *Didiscus pilosus*, *Prasophyllum elatum*, *Xanthorrhœa minor*, by Mrs. Luehmann; *Thryptomene ciliata*, *Prostanthera denticulata*, by Mr. P. Doran, from Mount Alexander; *Eriostemon obovalis*, *Helichrysum obcordatum*, by Mr. G. Knight, from Bendigo; *Eutaxia empetrifolia*, by Mr. H. King, from the Murray; *Helipterum polygalifolium*, by Mr. R. Embleton, from Lake Charm; and *Leptorrhynchus elongatus*, by Mr. W. H. Wooster, from Ballarat; *Passiflora cinnabarinna* (the Victorian Passion Flower), a rare specimen, by Miss Henley, from Wangaratta; Miss Coghill exhibited *Caladenia congesta* and *Chiloglottis gunnii*; Mr. C.

Frost exhibited *Diuris alba*; Miss Cochrane, Miss Roberts, and Mr. J. E. Dixon also exhibited flowers, sedges, and grasses.

This record is somewhat imperfect, as exhibitors in many cases omitted to furnish notes of their exhibits to the hon. secretaries, consequently some noteworthy plant may have been omitted in foregoing notes.

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#### A VERITABLE NEST AND EGG OF A BIRD OF PARADISE (*PTILORHIS VICTORIE*).

By A. J. CAMPBELL, F.L.S.

MUCH interest is attached to the Birds of Paradise, as also to their nests and eggs, very few of which have yet been discovered. It is known that we possess a genus (three species) of these beautiful birds in Eastern Australia—I refer to the Rifle Birds.

There has been much speculation about the Rifle Birds' nests and eggs, and one often hears curious descriptions about them by persons who—if one believe them—have either seen or taken the nest and eggs. A person will tell you he positively saw two nests last year in the "big scrub," lined entirely with shed skins of snakes—a most astonishing assertion. Another will inform you he had seen the eggs—oh, yes, frequently; that they were four in number and "whitish" (a very indefinite colour, to say the least of it), and that their resting-place was a hollow on the horizontal limb of a fig tree, which the birds scoop out! Gould states that, according to the testimony of the natives, the Rifle Birds lay white eggs in holes of trees. But during a recent excursion to the Richmond River district of New South Wales, the blacks informed me they had seen nearly every bird's "kin-dei" (nest) except that of the "Bung-bung" (Rifle Bird). It may be observed that Gould says the native name for the Rifle Bird is "Yass." That is the name given by the tribes on the Clarence River.

What reliable information I could glean from the whites was that the young birds, which are exceedingly clamorous, are first heard and seen about the middle of January, and that the old birds lay during December, and as my visit was early in November, I was evidently too early as far as the Richmond River species (*P. paradisea*) was concerned.

September, 1885, accompanied by two sons of our member, Mr. A. Coles, I visited the Barnard Islands, off the eastern coast of Northern Australia, hoping thereby to procure the eggs of the smallest Rifle Bird (*P. victoriae*). Again, unfortunately, I was too early, as the dissection of some of the females proved. A season or two subsequently Mr. French, F.L.S., kindly presented me with a nest and egg of this species from the Cardwell Scrub, for description, the authenticity of which he entertained not the slightest

doubt. The specimens were described in the *Naturalist* (April and September, 1887).

But, coming still nearer home, our good friend and secretary, Mr. Dudley Le Souëf, with Mr. Harry Barnard, of Queensland, visited the Barnard Islands last month (Nov.), and, as if drawn by a magnet, they actually pitched their camp under a tree which contained a nest and egg, and a Victoria's Rifle Bird sitting thereon. I cannot do better than give Mr. Le Souëf's own words for the discovery of the nest :—"The nest was found 19th November, 1891. Mr. H. Barnard and myself watched the hen bird for some time, and saw her fly into the crown of a Pandanus tree growing close to the open beach. Although we could not distinguish the nest itself, we could see the head of the bird as she sat on it. The nest was about ten feet from the ground, and the bird sat quietly, notwithstanding we were camped about five feet away from the tree. There was a single egg, the incubation of which was probably about seven days old." There is a difference between the nest and eggs taken by Mr. French's collector and the last found by Mr. Le Souëf. For all that, after critical examination, I am not prepared to say that they are not of the same species, only found under different conditions—one taken inland in a dense scrub ; the other found by the sea shore on an island. The nests are similarly constructed, while the general colour of the eggs is alike, with the exception that one is spotted, the other streaked. However, the nest and egg now exhibited by Mr. Le Souëf may be described as follows :—

NEST.—Somewhat loosely constructed of broad dead leaves and green branchlets of climbing plants and fibrous material. Inside may be seen two large concave shaped dead leaves underneath pieces of dry tendrils which form a springy lining for the egg or young to rest upon. Measurement in centimetres—over all, 19 broad by 9 deep ; egg cavity, 9 across the mouth by 4 deep.

EGG.—In shape nearly oval, but a little stouter about the upper quarter. Shell somewhat lustrous. Ground colour of the egg is of a fleshy tint, streaked in various lengths and breadths, longitudinally, with reddish brown and purplish brown. The markings commence near the apex, which is bare, and extend about half way down the shell, and assume the appearance of having been painted on (boldly at the top and tapering downwards) with a camel hair or such like brush. Many of the markings are confluent, the longest single one being 1.23 cm., by a breadth of .23 cm. There are also a few small spots near the lower quarter, and one large blotch of reddish brown which has a smudged appearance. Length of the egg, 3.14 cm. ; breadth, 2.32 cm.

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DESCRIPTIONS OF NEW AUSTRALIAN PLANTS, WITH  
OCCASIONAL OTHER ANNOTATIONS;

BY BARON VON MUELLER, K.C.M.G., M. & PH.D., F.R.S.

(Continued.)

ÆSCHYNOMENE ASPERA ; Linné, sp. plant, 713.

Port Darwin ; N. Holtze.

Under the designation *oligarthra*, a variety of this plant or a closely allied species, as gathered recently by Mr. Holtze jun., can be distinguished from the typical Asiatic and African form in somewhat broader fruits, consisting only of one or two or three pieces, conspicuously crisped at the margin, but not much asperous at the sides ; moreover the corolla of the Australian plant is hardly beset with any hairlets, while the lower petals along the outer margin are rigidulously fringed, which reminds of what Wight and Arnott stated in this respect about *A. Surattensis*. Our plant needs yet further study in free nature.

SWAINSONA CYCLOCARPA.

Laxe, scantly beset with very short hairlets ; leaves generally 5-7 foliolate ; leaflets from cuneate- to obcordate-ovate ; flowers several in each raceme, rather small, on very short stalklets ; lobes of the calyx semilanceolar-deltoid, shorter than the tube ; petals glabrous, upwards violet or lilac-coloured, the lower almost semiorbicular, blunt, hardly longer than the two lateral petals ; style imperfectly ciliolate at the inner side towards the upper end, pencillate behind the stigma ; fruit comparatively small, hippocrepic- or annular-curved, undular- and rugular-asperous, glabrescent, turgid, devoid of a conspicuous stipe, long-pointed at the apex, imperfectly bilocular by intrusion of the valves from the upper suture ; seeds several, brownish.

Near the Macdonell-Ranges ; Rev. W. F. Schwartz.

Plant about one foot long, slender-rooted and therefore perhaps annual, although the specimens obtained may represent first year's seedlings only. Leaflets  $\frac{1}{2}$ -1 inch long. Stipules sometimes considerably enlarged, but often small. Calyx hardly above  $\frac{1}{6}$  inch long. Petals measuring about  $\frac{1}{3}$  inch in length, the upper without very conspicuous callousities and all without twists. Fruits nearly or fully 1 inch long, but from its strong curvature appearing to be much shorter, scarcely  $\frac{1}{4}$  inch thick, lacunous-foveolar and with sharp prominences, pale, seemingly indehiscent. Seeds shining when well matured, smooth.

This species is singularly well marked by the almost circularly curved peculiarly rugulous fruit. In some respects it approaches *S. brachycarpa*, in others *S. oligophylla* and *S. occidentalis*. Dr.

Wawra described in the "Oesterr. Bot. Zeitschrift" of 1881, at page 69, a Swainsona as *S. murrayana* from the northern regions of our colony.

GEOCOCCUS PUSILLUS; J. Drummond and Harvey.

In calcareous and sandy desert-localities from West-Australia to the Murray- and Lachlan-Rivers.

This remarkable plant is mentioned here, to draw attention to the possibility, as indicated already by Bentham, that it may be the stemless state, fruiting sparsely underground, of a plant developing otherwise, like most Cruciferæ, its stem, inflorescence and fruits in the ordinary manner. Its foliage is not unlike the radical leaves of *Sisymbrium cardaminoides*, with which it is moreover not rarely associated. Indeed a Brazilian Cardamine of ordinary habit has been shown by Grisebach many years ago (in "Abhandlungen der Akademie von Goettingen"), to produce occasionally an abnormal state, resembling much our Geococcus, from the same root. But although the Italian *Morisia hypogaea* is in external appearance also very much like our *Geococcus pusillus*, that plant has never yet been traced to a stage of higher development, and seems therefore not to have arisen from mere dimorphism.

December, 1891.

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A WESTERN FOREST.

BY A MEMBER OF THE CLUB.

(*Read before the Field Naturalists' Club of Victoria, 16th November, 1891.*)

"THE troubled sea, when it cannot rest, whose waters cast up mire and dirt," is the very embodiment of an evil spirit; the mountains are the emblem of lofty grandeur and strength; the rolling plain or the lake—the eye of the landscape, it is said—possesses a soft, inexpressible loveliness, more noticeable, perhaps, in the receding distance; the desert mourns of melancholy and utter desolation. But what an irresistible charm there is within the holy precincts of a forest—truly "the visible living garment" of Infinite Nature! Except when devoid of poetical emotion (though if present, perhaps, unutterable), who has not experienced the divinity of a forest, or felt as if God were nearer in the forest than in any other works of His creation? Have not some of our poets endeavoured to touch but the hem of this living garment, if, haply, they might be imbued with its spirit? Yes, they have



Nest of the Grey-breasted Robin.

“ Heard the hymns of night and morning,  
 Learned the psalms of solitudes,  
 Knew that God was very near *them*—felt  
 His presence in the woods !”

In the ineffable Spirit of the Woods I hope to direct my hearers in thought for a little through the blithe pathways of a great western forest. But, alas ! how can one steal its beauty and put it into words ? A person who has seen a Queensland forest dressed in rich tropical verdancy, decked with waving palms and flowering tree-orchids, thriving on the very humidity of their situation, or has visited the everlasting forests of Victoria or Tasmania, with giant trees and gullies giving off refreshing terrestrial odours, and full of graceful tree ferns, will soon notice, if observant, a very characteristic difference in a West Australian forest, where everything is light, buoyant, balmy, and where the very trees of the wood seem to rejoice. Nothing depresses ; even the atmosphere seems the purest of the pure. But still, generally speaking, the colour of the forest, as a whole, does not wear the vivid, animated tints of eastern woods, but has a calm tone—deep, soft, subdued.

The annual rainfall of the forest is about 45 inches ; yet with that amount of moisture no humidity is present to irritate one or to add to one's discomfort. Then, again, throughout the year the mean temperature (58 degrees) is very regular, there being no great extremes of heat or cold. The ways of biting frost are unknown in the

“ Secret hollows dear to noontide dew ;”  
 and it seldom is very oppressive

“ When fiery December sets foot in the forest.”

But the neighbourhood of the Cape Leeuwin district—the heel, so to speak, of our great island-continent—by virtue of its position, seems to be a vortex or meeting-place for the pent-up winter storm winds of the Southern and South Indian Oceans, which fiercely disturb the otherwise quiescent forest-clad country, where

“ The swift rains beat, and the thunders fleet  
 On the wings of the fiery gale,  
 And down in the glen of pool and fen  
 The wild gums whistle and wail.”

However, it is spring when we enter the forest, and “ lo, the winter is past, the rain is over and gone, the flowers appear on the earth, and the singing of birds is come.” But spring appears a month later than on the eastern coast, judging by the flowering of the acacias ; so, instead of

“ Yellow-haired September ”

as in the east, here in the west we find

" October, the maiden of bright yellow tresses."

Every glade and nook of the forest is illumined with the acacia blooms, from pale canary colour to soft rich chrome. *Acacia divergens*, with bowing head-stalks arrayed in rows of flowers, is a lovely example of the former colour; while *Acacia pulchella* is a splendid specimen of the latter, throwing out an abundance of "wee furry balls" before its delicate feathery green foliage has developed. Both these pretty shrubs love to dwell in the damper regions of a Red Gum forest. These Red Gums, for beauty of foliage, are the pride of all the eucalypts. But here let it be explained that they are not the so-called Red Gum (*E. rostrata*) of eastern celebrity, but are trees of exceedingly handsome umbrageous figure, with hard rough bark, resembling the better known Ironbark. The vernacular name of the Red Gum for this part has evidently been suggested by the amount of resin-like kino that bleeds freely from the trunks. The botanical name is, however, *Eucalyptus calophylla*. The forest paths are strewed with the large, hard, round calyx lobes. A pedestrian is apt to find himself rolling upon them and skating into a thorny acacia, or coming into violent collision with a neighbouring tree-hole; but, of course, the sacredness of the forest prevents the use of strong language. Winding amongst the dark rough barrels of the Red Gums we have just time to notice the more striking reliefs of bright-foliaged Hakea, Templetonia (in bloom), Banksias with flowering cones ten or twelve inches long; elegant Cycads, with palm-like frondage, and drooping Grass-trees (*Xanthorrhœa*), both of which lend graceful figures to the sylvan scene.

Closely allied to the Red Gum is the Scarlet-flowering Gum, which is confined to a narrow strip of the great trackless forest of the southern coast. Our much-honoured patron, Baron von Mueller, who first described the species, graphically states:—" Hardly anything more gorgeous can be imagined than the forest of *Eucalyptus ficifolia* about the month of February, when brilliant trusses of flowers diffuse a rich red over the dark green foliage of the whole landscape."

Here we come to the celebrated Jarrah-Jarrah (*E. marginata*), a moderately sized tree, in appearance not unlike a Stringybark, and which may be readily distinguished from its congener, the Red Gum, by its smaller foliage and flowers. As its leaves are evergreen, so is its wood almost everlasting. The iron-banded grain seems to partake of the very nature of the soil upon which it grows, namely, ironstone country, and on the hills, with rock-encrusted roots, the finest specimens exist. The smaller trees

or scrub of the Jarrah country are not so numerous or thick as those of the Red Gum forest, being chiefly She-oak (notably *Casuarina decussata*); Nuytsia, producing splendid crests of massive orange flowers at Christmas time, and so-called Native Pear (*Xylomelum*) with thick, stiff, verdant foliage. There is also a most lovely flowering shrub, bearing wreaths of blooms not unlike double pink hawthorn, imparting a singular blush of beauty to the wayside. This beautiful plant, though worthy of cultivation, has literally no name among the dwellers of the forest; but in botany is known by the sternly conservative appellation—*Hypocalymma*.

We are tempted to explore a swampy gully near. What a revelation! There we see Boronia ten feet high, adorned from top to bottom with pink bells. Out of oozy damp soil grows a prolific crop of four-cornered rushes, above which the Boronia thrusts its small foliage, every branchlet being embellished with rows of lovely carmine flowers. Kunzea, of ti-tree like appearance, overarch and protect the Boronia from the boisterous elements, at the same time narrowing the scrub down in places into the most beautiful roseate vistas.

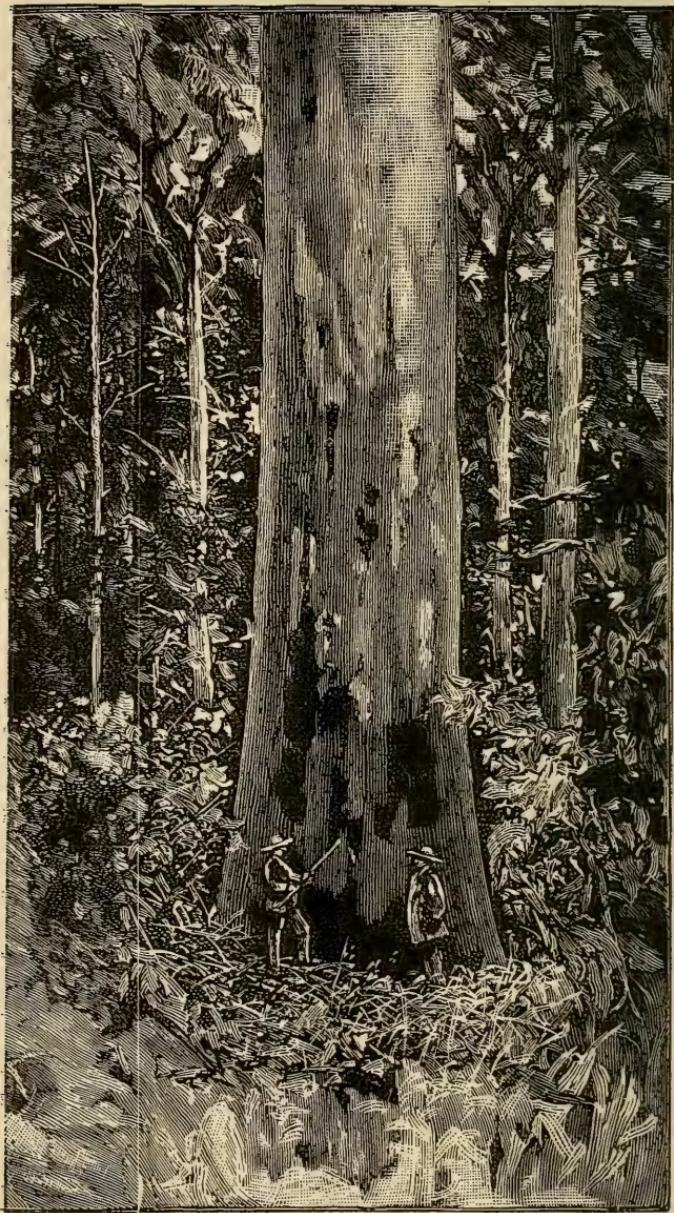
On a gentle rise on the outskirts of the forest we break upon an ornamented patch carpeted with

“Shining tracts of green-haired mosses,”

and surrounded by Grass-trees and Peppermint (*Agonis*) trees—the latter being exceedingly handsome, dressed in long, pendulous foliage flecked with white flowers, diffusing sweet odour like that of new honey. Three striking creepers, also flourishing hereabout, are in full bloom—the beautiful bluish or purplish Kennedya, native scarlet runner (*Glycine*), and “clematis-like, starry Jasmine.” But few bush scenes for exquisite loveliness exceed the western species of Kennedya when seen with unrestricted freedom enveloping a moderately sized Peppermint tree with a wealth of rich purplish flowering clusters.

There are other charming objects in our forest. Yonder lies a Casuarina branch, dead, and half hidden in rich springing grass; above it shoots a garden of orchids of a rare shade of pink, which look exceedingly captivating with their somewhat rounded petals and bright polished surfaces. But we cannot linger over this delightful contrast—the brown twigs, beautiful in death, the verdant grass and the pink flowers—but must hasten away inland to explore the sacred recesses of a Karri forest.

We pass along a swamp studded with crooked-stemmed Melaleuca, with light-coloured bark, ragged and tattered, in curious contrast to the placid waters of the lagoon, while threading



A Giant Karri Tree.

the succulent herbage on the margin are climbing sundews (*Drosera*), showing flowers in varieties of pink and white. Here, too, is an Eriostemon, a bush covered with small white flowers. Pluck a leaf therefrom, bruise it, rub your flesh with it, and a few hours subsequently a blister will appear on your skin like that of a burn or scald. If chemically treated the oil of the "blister" plant might prove useful in pharmacy. Near the end of the swamp is a patch of Bottle-brush (*Callistemon*), with a few flaming flowers blooming beyond their time. The flowers at seasons yield a nectar of seductive propensities. Honey-eating birds love to regale themselves on this nectar, which laps their senses into a dreamy repose—in plainer words, they become drunken, and may be captured easily by hand on the ground about the bushes. We have heard of insects becoming affected by the soporific influence of certain flowers, but in no other instance have we heard of birds.

Eventually we arrive within the delightful shades of a virgin Karri forest. We are hardly prepared for such a surprise. Our first thoughts naturally revert to Gippsland, but a grander forest is here. All around, to the exclusion of the other great trees, we see Karri holding undisputed sway in regiments of huge, stately, cylindrical figures, resembling White Gums. They average about 200 feet in height, with uplifted ponderous branches, like rafters supporting a "wilderness of foliaged skies." The foliage, however, is tufty, and not so thick as Jarrah, therefore plenty of light is diffused through the sylvan aisles. Negotiating a fallen monarch here and there, and penetrating deeper into the vast primeval woods, we indeed feel that

"Psalms of great forests make holy the spot."

The ground scrub is chiefly a variety of native hazel (*Cryptandra*), but not so dense as the hazel thickets of Gippsland fame. The eucalyptian giants thrive in rich reddish-coloured soil on a limestone formation. The stone occasionally outcrops, or by subterranean subsidences causes curious deep inverted cone-shaped hollows to exist, over which a bird's-eye view is obtained of the scrub below. In a mossy nook a small *Asplenium (trichomanes)* is growing in pretty bunches. It is a pleasant association to reflect that this little fern is found in the far-off British Isles—the home of our adventurous fathers—as well as in these western forest dells. As a rule our vast western territory is singularly devoid of ferns; the number at present known can just be counted on one's fingers. The noisy Scrub Bird (peculiar to these parts) with powerful penetrating notes wakes up the echoes of the forest. Lorikeets in small companies are screeching aloft; in the leafy boughs a few other gorgeous parrots are noted busily engaged in

nesting operations, while in the lower thicket the Brush Wattle Bird's gurgling voice is heard.

But to return to the Karris. When a bush fire sweeps through their wooded avenues the trees remain unharmed, not as the hollow giants of eastern forests, which, after an invasion of the fire-fiend, are left like high roaring chimney stacks. This remarkable soundness of bole is applicable to nearly all western timber trees, and may be attributed, in a measure, to the regular mean temperature previously mentioned as pervading these magnificent forest regions. The Karri, or rather "Karri-Karri" of the aborigines, is known in scientific lore as *Eucalyptus diversicolor*. Here is a typical tree, and a grand forest patriarch it is, dressed in a smooth grey coat, variegated with silvery patches; the base is protected by small shields of a darker and more brittle outside bark, and foot covered with verdant mosses. At a few feet from the ground its swelling girth measures 30 feet. The first bulky arm is 130 feet from the earth, while mathematical computations based on the theodolite prove its entire height to be nearly 264 feet. We hear of individuals 400 feet in altitude, with bases 60 feet, but we have not time to search for these colossal dimensions just now, though they may be yet found in the trackless "far-folded" forest of the River Warren district, where the most gigantic Karris are supposed to exist, and which repeat the grand and noble features of the White Gums—the vegetable giants, not only of south-eastern Australia, but of the globe. It should be mentioned that karri timber, like jarrah, is gaining world-wide fame for its strength and durability. Sufficient to say that next to Indian teak (which heads the list), and before the celebrated British oak, the Australian karri and jarrah take their place on the British Admiralty's schedule for ship-building and other important works. But we must now reluctantly withdraw our footsteps from this western forest region, so replete with instructive and fascinating life. Did time permit we might have mentioned the many beautiful feathered denizens—lovely Parrots and two species of Black Cockatoos peculiar to western parts, several graceful Honey-Eaters and pretty Robins that prefer to saddle their shapely nests in the fork of a grass tree, well protecting with its rush-like canopy the home from rain or heat; while of furred creatures the largest Kangaroo and the comical little "Quaka"—the smallest of wallabies—are also found within the charmed boundaries of a Western Forest.

[The woodcuts of the Grey-breasted Robin's Nest and the Giant Karri Tree have been kindly lent by Mr. Walter Davies.]

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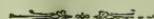
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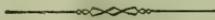
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VOL. VIII.—NO. 10.

FEBRUARY, 1892.

# The Victorian Naturalist:

THE JOURNAL AND MAGAZINE

— OF —

The Field Naturalists' Club of Victoria.

PUBLISHED FEB. 1, 1892.

Editor: A. H. S. LUCAS, M.A., B.Sc.

The Author of each article is responsible for the facts and opinions he records.

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THE  
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VOL. VIII.—No. 10. FEBRUARY, 1892.

No. 98.

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FIELD NATURALISTS' CLUB OF VICTORIA.

THE monthly meeting of the Field Naturalists' Club of Victoria was held in the Royal Society's Hall on Monday evening, 18th January. Mr. C. Frost (one of the vice-presidents) was in the chair, and there was an attendance of some 80 members and friends.

LIBRARIAN'S REPORT.

The hon. librarian reported the receipt of the following donations to the library:—“Report of the Missouri Botanical Garden,” 1890, from Director; “Proceedings of the Academy of Natural Sciences, Philadelphia,” 1891, part i.; “Journal of the New York Microscopical Society,” vii., 4, October, 1891; “Botanical Bulletin” No. 14 (“Contributions to Queensland Flora,” by F. M. Bailey, F.L.S.), Department of Agriculture, Brisbane; “Botanical Reminiscences in British Guiana,” by Dr. R. Schomburgk; “Proceedings Zoological and Acclimatization Society of Victoria,” vol. v., 1878; “Proceedings of the Linnean Society, New South Wales,” iv., 3 (three latter from Mr. F. G. A. Barnard); “Transactions of the Royal Society of South Australia,” xiv., 2, from Society; “Records of the Australian Museum,” i., 10, from Museum; “Quarterly Mining Reports,” September, 1891, from Mining Department; “List of Named Insects in South Australian Museum,” J. G. O. Tepper; “Proceedings Field Naturalists' Section of Royal Society of South Australia,” 1890-91, from Society.

ELECTION OF MEMBERS.

A ballot of new members took place, resulting in the election of Messrs. F. Ellemor, H. Giles, Wm. Godfrey, jun., G. T. Richardson, and F. W. Steel.

PAPERS.

Mr. G. A. Keartland read the first paper, which dealt with “The Troubles of an Oologist”—troubles arising principally from the difficulty of determining the species to which an egg belongs, from the size, shape, and colour-markings, since variation in these particulars occurs, not only in specimens of the same species obtained

from different localities, but even in those taken from the same nest. Remarkable examples were shown in illustration in the eggs of the Hill Crow Shrike, Pied Grallina, Silver Gull, White-eyed Crow, &c. The material of which the nests are composed is also no true guide, since this frequently varies, according to the locality and surroundings in which the nests are built. Mr. Dudley Le Souëf corroborated Mr. Keartland's observations.

Mr. D. Best, who acted as the exponent of those members who attended the late excursion to the Grampians, brought up a lengthy report of the trip. The precise locality chosen for operations was Hall's Gap, and pitching their camp in close proximity to the borough hut—courteously placed at their disposal by the Borough Council—the naturalists were able during the fortnight spent there to do some good work in collecting. Splendid weather favoured them, but the preceding dry winter and late spring had possibly limited the supply of insects, since very few captures were made by the entomologists; snakes and lizards were also scarce, and the bulk of success fell to the botanists, who brought back a really good collection of plants. The paper was illustrated by means of limelight views, prepared by Mr. J. Searle from photographs taken on the trip, and at the close of the meeting a special vote of thanks was accorded him for the additional pleasure his illustrations had given.

#### EXHIBITION OF SPECIMENS.

The following is a list of the exhibits with which the meeting terminated:—By Mr. H. P. C. Ashworth.—Birds and photographs from the Grampians. By Mr. J. E. Dixon.—54 species of Coleoptera collected at Kerrisdale, Mordialloc, and Oakleigh, included among them being *Piesarthrius marginellis*, *Distichocera* (var.), *Uracantha bivitta*, *Uracantha* (sp.), *Phoracantha* (sp., rare), *Mecynopus semi-vitreus*, *Iotherium metallicum*, *Stigmadera variabilis*, *S. suturalis*. By Mrs. Flatow.—Fungi from Northern Territory, also berries of *Abrus precatorius*. By Mr. C. French, sen.—*Ogyris genoveva* (Miskin), *Lycena taygetus* (Miskin), *Holochila albosericea* (Miskin), new, *Aciptilia aptalis* (Walker). By Mr. C. French, jun.—Eggs of Whistling Tree Duck, Whistling Eagle, Maned Goose, and Leach's Kingfisher, from Queensland; also splendid clutch of Pied Grallina's eggs from Wimmera. By Mr. C. Frost.—Flowers, Spiders, Lizards, and Snakes collected at the Grampians. By Mr. E. H. Hennell.—Beetles—About 80 species of Longicorns, about 70 species of Buprestidae; larvae of Banksia Moth for distribution; Orchidæ (*Cryptostylis longifolia*, *Dipodium punctatum*, *Orthoceras strictum*), and *Lobelia nudicaulis*. By Mr. G. A. Keartland.—Eggs, in illustration of paper. By Mr. Geo. Lyell, jun.—60 species of Moths, collected since September last at Gisborne. By Baron von Mueller.—Plants recently

collected at the Grampians by members of the Club. By Mr. G. J. Page.—Specimen of the Green Hydra (*Hydra viridis*). By Mr. Alan Robertson.—One pair of stuffed Moles from Thurso, Caithness, N.B. By Mr. J. Shephard.—Specimen of *Megalotrocha albo-flavicans*, found at Heidelberg. By Mr. D. Le Souëf.—Mantis and lizards. By Mr. F. Spry.—Larva, chrysalis, and butterfly of *Pieris teutonia* (Fabr.), *Delias harpalyce* (Don), *Delias aganippe* (Don), *Hypochrysops delicia* (Hew.), larva of *Delias harpalyce*, with parasites, and larva of *Delias aganippe* with Ichneumon. By Mr. T. Steel.—Collection of Lizards from Mt. Lofty, South Australia.

AN excursion to Clyde (*vid Berwick*) took place on Saturday, 5th December, but as the longer trip to the Grampians had monopolized the attendance of many of the members who usually take part in the local excursions, the number taking part in it was very limited. The leader (Mr. F. Wisewould) met the party at Berwick station, fully provided with the necessary accommodation for a drive of some four miles to Clyde, and on the way there a Copperhead Snake was sighted, and killed by the leader before it could make good its escape. Arriving at Clyde, some two hours' collecting was done, and then a halt was made for the mid-day meal, which proved very acceptable after the mild excitements of the chase. We had no sooner started new country, however, then it began to rain, and it continued with such vigour that a retreat had to be made to Mr. Wisewould's homestead, some two miles distant, where a supply of dry clothes and afternoon tea made us happy once more, and gave us reason to congratulate ourselves that we were in such good hands. Directly the rain stopped we were out again, this time to be initiated into the mysteries of amateur farming, which our leader indulges in as an antidote to the wear and tear of his professional duties. Five o'clock brought the evening meal—on strictly temperance principles—which was thoroughly enjoyed, and half an hour's drive after it enabled us to catch the train at Berwick which was to carry us to town. Mr. T. S. Hart, B.A., furnishes an abbreviated list of plants found in flower at Clyde on the occasion of this visit:—*Rubus parvifolius*, *Leptospermum lanigerum*, *Goodenia elongata*, *Teucrium corymbosum*, *Mazus pumilio*, *Gratiola peruviana*, *Orthoceras strictum*; whilst Rev. W. Fielder recounts the capture of the following Land Planarians:—*Sugdeni*, *alba*, *mediolineata*, *quinquelineata*, *munda*, and *hoggi*, the variations from the typical form of the latter being very marked in some specimens—one having lost all the stripes except some faint marks at anterior end, which could only be made out with the help of the lens.

## TRIP TO QUEENSLAND.

BY DUDLEY LE SOUËF.

(Read before the Field Naturalists' Club of Victoria, 14th December, 1891.)

I LEFT Melbourne by train for Toowoomba, Queensland, via Sydney, on the 19th October, the object of my visit being to collect specimens of the fauna of that portion of Australia for the Zoological Gardens of this city. In the neighbourhood of Brisbane, Rockhampton, Townsville, and other places on the north-eastern coast, there are many interesting examples of the native animals only obtainable in those localities. While having this object principally in view, I was also anxious to obtain as many specimens of insect life as possible. I need not describe more than a few incidents on the journey up; the scenery for the most part being very monotonous. On coming to the Darling Downs, we passed through country with dark volcanic soil, far famed for its fertility. The Darling Pea flourishes here, and some of the land looked very pretty with its purple carpet; but in dry weather, when grass is short, the stock frequently take to it as food, and the effect on the beast is first noticed by a disposition to shun others of its kind. It gets what is popularly known as "the staggers," and, rejecting all food except the pea, eats it greedily till it dies. The stock, however, do not seem to suffer much from it as long as there is plenty of other food obtainable.

I arrived at Toowoomba on Wednesday evening, and next morning obtained some beetles, earth and planarian worms, but had very little time for collecting, as I had to visit a neighbouring station. The country was dry, and, excepting a Brown Snake (*Diemenia superciliosa*), I obtained nothing of importance. The Fairy Martins (*Lagenoplastes ariel*) are very numerous here and build in colonies under the bridges and other suitable places, and their curious, retort-like nests were very interesting. The nests of the White Ants are very plentiful, being generally small mounds about three feet high; most of them have a good-sized hole in them, which the Echidna evidently makes when in search of the unfortunate ants as food. A few days before I arrived an Echidna was found in a belt of Brigalow scrub (*Acacia harpophylla*), with a dead Carpet Snake wound round it and well fixed on the spines. It was evidently a case of the "biter bit," as the snake had probably tried to crush its victim, but had got pierced by the spines in its attempt to do so and there died. The Echidna was apparently unhurt, and walked about with its uncanny load without much trouble. Hares are also very plentiful, this heavily-grassed land just suiting them. Native Bears are numerous, and

during a ride of about ten miles through lightly-timbered country I counted sixteen on the trees growing on the road. They have more white on them than those of Victoria. A good many Bustards and Southern Stone Plovers were seen. Whilst I was here a heavy hail storm passed over the country, but was fortunately confined to narrow limits. The hailstones, being like small blocks of ice, killed numbers of poultry, perforated corrugated iron roofs and glass windows, and completely destroyed fields of maize, wheat, and other grain. In my rambles I only came across one small Brown Snake, which, with a little gentle persuasion, I got into my bag, and have brought back alive.

I left Toowoomba again for Brisbane after a delay of three days. The country for the first few miles is hilly, and the views obtained are very fine; there are numerous cuttings and short tunnels as the line winds its way down to the lower country. Brisbane was reached the same night. Next day, I went out to a timbered reserve near the city and obtained a few beetles and a large specimen of the Bearded Lizard (*Grammatophora barbata*). I saw several Lace Lizards (*Hydrosaurus varius*), but did not succeed in capturing any. Once I heard a frog croaking close by me, and as everything was so dry I could not think where the sound proceeded from, but after a time found it had its home about four feet down a small hollow branch on an old dead fallen tree, about six feet from the ground; but being without a tomahawk I had to leave it undisturbed. I hunted about under logs and bark, but only found ants, which were very numerous. The White Ants frequently make their nests in the trees, generally about half-way up the trunk, and the nests are generally the shape and size of a football, having a covered track to them from the ground, on the under side of the tree, so as not to be disturbed by opossums or other climbing animals. In some parts of the country near this place Grass Trees are very numerous; their flower stalks, generally about ten feet long, present a curious appearance when growing thickly together.

The day following I left by train for Bundaberg, and passed through some beautiful tropical scenery, although the journey was, for the most part, very uninteresting. Several Ti-tree swamps were seen, and also Banksia trees, which seem generally to grow in damp country. The bulky nests of the Pomatorhinus were frequently passed, generally fixed at the end of a thin branch. The tropical scrub before referred to was very dense in places, and numerous specimens of Cedar, Beech, Ash trees, Sassafras (so called), Hoop or Moreton Bay and Bunya pines, and also the Giant Nettle, were to be seen, many of the trees being very tall, with creepers entwining them, whilst orchids and ferns of large size found a precarious foothold high up on the branches.

Different kinds of palms were also numerous, and lent their aid to the beauty of the vegetation, and one could almost imagine oneself transported to another country, had not the sight of a Laughing Jackass sitting on the branch of a dead tree near by quickly dispelled the illusion and brought one's thoughts back to Australia. We also passed close by one of the Glass Mountains, about 500 feet high; and very curious it looked, rising abruptly from the surrounding undulating country. It was too steep to be ascended from the side we viewed it, and was covered with short, dry-looking herbage, but very few shrubs. At Gympie station we noticed a disreputable looking old blackfellow, wearing a brass plate on which was engraved—"Mr. Boomer, King of Glass Mountains." He seemed very proud of it, and, when begging from the passengers, expected a little more in consequence of his title. There was a camp of 75 blacks close to the town, and we saw many of these gentry going about, accompanied by a numerous following of dogs of all breeds. Blacks and dogs seem to sleep together indiscriminately in their small humpies. Near here were seen the little Peaceful Doves (*Geopelia tranquilla*), which are not found south; Leatherheads were also numerous, and their nests, which they build of bark, were seen hanging on the ends of thin branches, making them difficult to obtain. That graceful tree, the Silky Oak (*Grevillea robusta*), was plentiful in some places, and is a far prettier tree than those that grow about Melbourne.

I arrived at Bundaberg after dark, and going along the street saw in the window of a chemist's shop a snake in spirits. I immediately interviewed the proprietor, who showed me a large Death Adder that had been recently killed, as well as some other varieties of snakes found in the locality. Then he took me over to the School of Arts, a fine stone building near the centre of the town, where is the nucleus of a small museum; the few specimens on view appearing to be well looked after. Indeed, the whole building is a credit to the town. The larger kind of frogs here are evidently very useful in destroying cockroaches, and it is amusing to watch the operation. Seeing one of those disagreeable insects the frog crawls slowly towards it until about a foot away, when he springs upon it with apparently open mouth and seems to scoop it in at once. A resident here kept some small black leeches with the larger striped variety, but he found that the smaller killed the larger, so had to separate them.

At daylight the following day I left for Rockhampton, and passing down the river, the banks of which are in places lined with Mangrove bushes, saw a few Pelicans, Curlews, Sandpipers, and Gulls, but as it was the breeding season of these birds it would account for the few about here. We arrived at Rockhampton next day. The town itself is about forty miles up the

Fitzroy River from Keppel Bay, and the land in the immediate vicinity of the town is flat and uninteresting, but there is plenty of swampy land a few miles out, where Magpie and Pigmy Geese, ducks, and other waterfowl are numerous. It is here too that that curious little bird, the Comb-crested Parra, or Lotus Bird, is found, which builds its floating nest in the swamps. A pair of young Jabirus were offered for sale, which had been taken in September from a very large nest, about four feet in diameter, on a tree near the centre of a good-sized swamp ; the birds were full grown, and no dog or cat dare approach them in their yard, as they were able to give a very severe blow with their large bill. When coming up the river I saw a crow single-handed chasing a Wedge-tailed Eagle, which was at last obliged to take refuge in the scrub from its assailant. A fine pair of White-bellied Eagles were also seen ; one was sitting on a small dead bough overhanging the river, when, its companion essaying to sit on the same bough, their combined weight broke their perch and they were both precipitated into the water. The principal fish caught here are the Burramundi, Kingfish, Bream, and Rock Cod ; the latter being generally caught near the mouth of the river, which, like most Queensland rivers, is tidal for some miles inland, and consequently very muddy. A very large specimen of the Rock Cod, 7 feet 3 inches long, and weighing 174 lbs., was caught whilst I was there, and was on view as being a marine wonder, which it undoubtedly was. A few goat carriages were seen here, either driven by children for amusement or carrying purchases from the market or shops, and they seemed very useful ; occasionally a pair were harnessed in, but as a rule only one. These animals are very numerous in Queensland, as they can thrive on scanty vegetation and little water, and in many places they are used for food instead of sheep, especially in cattle country.

I left early next morning by train for Duaringa, to visit Mr. Barnard, at his station, Coomooboolaroo. On the journey up we passed close to Gracemere station, and got a view of the large lagoon there. It was here that Mr. Carl Lumholtz (the author of "Among Cannibals") stayed some months. At the station there was much to interest me, and my first effort was to look through Mr. Barnard's unrivalled private collection of butterflies, moths, beetles, wasps, bird's eggs, skins, &c., &c. All the specimens are in splendid condition, and for the most part have been collected by himself and his sons, and the time and patience expended in getting together such a collection must have been considerable. Nearly everything is named, and the locality where obtained noted, which adds very considerably to its scientific value. The country round is generally lightly timbered, but with belts of thin scrub here and there, in which the Scrub Turkey, or Talegalla, makes its mound, and in which wallabies also abound, coming

out to feed during the evening. When riding out with Mr. H. Barnard, we discovered the nest of the Collared Sparrowhawk, about 90 feet from the ground, in a tall Lemon-scented Gum tree, with smooth slippery bark and no branches for fully forty feet. With the aid of a tomahawk Mr. Barnard soon went up the tree by cutting notches for his toes, and secured a clutch of three eggs. About a hundred yards away was found the nest of the Crested Hawk, with the bird on the nest. The nest was built high up on a smooth-barked gum tree, but it was also robbed of two whitish eggs by the indefatigable climber. We then rode on for about a quarter of a mile, when we espied, on the topmost branches of a gum tree, the nest of the Australian Goshawk. Our climber again tried his skill, and, ascending the tree, secured the three eggs that were in the nest ; tying them up in his handkerchief and holding it with his teeth, he brought them safely down. We then rode on to a swamp some distance away and found on it a pair of Black Swans and four cygnets, some Whistler Ducks, Slender Teal, Plotus Birds, Coots, White Egrets, White-fronted Herons, and a pair of Whistling Eagles that were on a tree near the swamp. In the coarse herbage near the edge numerous Bandicoots had their nests, and we also disturbed several Rails ; and hearing a pair of M'Leay Kingfishers making a great commotion, we crept noiselessly up to the tree and saw the birds darting at an Iguana, or Lace Lizard, which had taken shelter there on our approach. It was an easy matter, by throwing sticks, to dislodge the creature from its refuge, and once on the ground we easily despatched it. The Kingfishers had a nest with five eggs in a neighbouring tree. The Plotus Birds, or New Holland Darters, sailed round and round at a great height, and, like birds of prey, hardly flapped their wings. Black Duck here seem to frequently build in holes of trees, like the Wood Duck, and one was seen by Mr. C. Barnard bringing down its young from the nest, apparently in its beak, and in doing so seemed almost to drop down from the nest to the ground.

On leaving the swamp we rode to a place where some Black-headed Snakes (*Aspidiotes melanocephalus*) were known to live, and on our way saw three Kangaroos (*M. giganteus*). Arriving at the first log where a snake was expected to be found, we cut holes in it, but discovered that the reptile had left for fresh quarters ; another log was tried, but with like success, its occupants having also shifted. Riding to a log where one had been seen a fortnight before, and cutting a hole in it, we found the snake at home. It proved to be a good specimen, about ten feet long, and it was soon transferred to our bag. On returning to the station, we passed through a belt of country about four miles wide, over which two years before, in December, a hail-storm or cyclone had passed. More than half the trees had

been blown down; others had all their branches broken off. The hail and wind together stripped every leaf off many of the trees, and took the bark off the weather side of all the smooth-barked branches and bushes, even the big Lemon-scented and other gums suffering in like manner. The hailstones were about the size of pigeons' eggs, and the wind blew with terrific force. The cyclone only lasted about a quarter of an hour, and after it had passed over all kinds of birds were found lying dead, also Native Bears and Opossums.

On another day we went out walking on a stony ridge not far from the station, and were fortunate in flushing a White-throated Nightjar from the ground and finding its egg. There was not the slightest appearance of a nest—in fact, the hard stony ground where the egg was laid must have been very uncomfortable for the bird to sit upon; the egg was hard set, but we managed to blow it successfully. Shortly after we disturbed a Squatter Pigeon from the ground and found its nest, which was made of a little dry grass, with two eggs in. An Australian Goshawk was also seen to swoop down on an unfortunate Squatter Pigeon and carry it off. When having a spell under a shady tree, we watched a pair of crows sitting close together on a neighbouring tree, but they did not see us. A Leatherhead evidently was watching them too, and flying quickly past behind them, gave one of the crows a dig on the back with its beak. The crow gave a loud "caw" and looked very surprised at the temerity of the Leatherhead, which did not wait to see the result of its attack. Shortly after the crow flew to a bush close by and with some difficulty broke off a dead twig and flew off with it towards a tall Lemon-Scented Gum tree, but before it got half way it knocked the twig out of its beak with its wings. However, it caught it again before it reached the ground and, after resting on a small tree, made another attempt, but with the same result. It then held one end of the twig in its beak, with the other end sticking straight out, and succeeded in reaching the gum tree, where it was building its nest. A Dollar Bird probably also had its nest in the neighbourhood, as it was flying excitedly about and going in and out of a number of holes in the trees, with the evident intention of misleading us as to where its nest really was. The bird is so called from a round white patch on each wing the size of a dollar; and it utters some very curious notes, but not quite so erratic as the sound the Leatherhead makes. When near the house we found the nest of the Black-throated Butcher Bird and the Collared Butcher Bird, which had been built in small Bloodwood trees about 30 ft. from the ground, the eggs of both being just about hatching; and in a Rosewood tree near the same place, a Pomatorhinus had built its bulky nest, which contained three eggs. The little native bees had a hive, generally known by the name of

"sugar bag," low down on the same tree. These bees are very small and dark in colour and do not sting, and the hives have usually about a quart of honey in them. Several nests of the Laughing Jackass (*D. gigas*), were seen, these nests being generally made by scooping out a hole in the White Ants' nests, on the trees. The ants' nests seem also to be the favourite nesting place of the Sacred and M'Leay's Kingfishers, which make a small hole through the often hard exterior and a larger chamber inside, which is easily hollowed out, but the Leach's Kingfisher, which is found nearer the coast, builds in the hollows of trees. The great enemy of birds here is the Iguana, or Lace Lizard; on one occasion Mr. C. Barnard found one eating the eggs in the nest of a Black Duck which had built in a hollow in a gum tree. On another occasion we walked over to a big belt of scrub about two miles away, and came upon several old mounds of the Talegalla, but the weather had been too dry for them to start making up the nests for this season, as they require rain to make the leaves, &c., damp for generating the heat necessary for the incubation of their eggs. We also saw a few of the birds themselves, which when disturbed flew into the lower branches of a tree and gradually worked their way to the top, from whence they flew. Their mounds are about 3 feet high by 7 feet in diameter and the temperature, as I afterwards found, was 95°. The number of eggs seems never to be more than thirty, and oftentimes less, and three birds apparently lay in one nest. Several good specimens of the curious Bottle Tree (*Sterculia rupestris*) were seen here; their bark is hard, but the wood inside is very soft and moist, so much so that in times of drought the trees are cut down and stripped of their bark, when they are carted to the homestead and cut up into small pieces for the cattle to eat, which they do greedily. Others are cut down, stripped of their bark and then left for the cattle that are in the neighbourhood, and the famished stock leave very little, even eating down into the roots as far as possible. There are two varieties of this tree, the broad-leaved and the narrow-leaved. On coming out of the scrub on our return a large Cuckoo (*Euduinamis flindersi*) dashed past, with a Leatherhead in full chase; it had evidently been in too close proximity to the Leatherhead's nest, a proceeding naturally resented by the rightful owner. The cuckoo seems apparently to be very cowardly, as it is generally chased away by a bird much smaller than itself. Several varieties of lizards were found near here. Amongst them being the Lace Lizard (*Hydrosaurus varius*), Gould's Monitor, the curious lizard *Nephrurus asper*, the Frilled Lizard (*Chlamydosaurus kingii*), the Bearded Lizard, with several Geckos and Hinulia Lizards, the latter being very active and hard to catch without breaking their tails.

A day or so later we all drove to some granite ranges about twelve miles from the homestead, and on arriving there some of us went along the range where the rocks were high to hunt for Rock Wallabies, which live in the crevices in the rocks. We had some exciting attempts to capture them, as they ran up the sides of the rocks and into the trees in a wonderful way. They seem to be adepts at climbing, as we frequently saw them perched on the lower branches of the trees. We managed to catch one and, transferring it to a bag, took it back to the camp. We found that during our absence a lady of the party, whilst looking for flowers, had come across a Carpet Snake about ten feet long, which was coiled up asleep under a clump of bushes. An opossum had just furnished it with a hearty meal, which it was quietly digesting. The animal was easily transferred to our bag, and it is now in the Zoological Gardens with the Black-headed Snake. Both the Carpet and Black-headed Snakes evidently feed at night and their favourite camping place is in the rank grass near water, where they can secure Kangaroo Rats, Opossums, &c., for food. Under a rocky ledge I was fortunate enough to discover an Echidna (*E. acanthion*), with its young one. This variety is peculiar to Queensland, I believe, and it was the first Echidna I had come across with a young one. The little thing was devoid of all hair or spines, but I regret to say that the mother and young escaped from confinement when at Rockhampton on their way to Melbourne. While clambering over the rocks we saw a pair of the Wallaroo Kangaroo (*M. robustus*). Those animals are now very scarce in this neighbourhood, but formerly, it is said, they used to be plentiful.

At the homestead there is a pretty garden, in which flourish oranges, lemons, bananas, peaches, pineapples, &c., and different kinds of birds make it their home and breed there. Ring Doves, Barred-shouldered Doves, and Peaceful Doves all live and breed in harmony, and at feeding time in the afternoon they flock to the verandah to pick up the grain. The Ring Doves used to feed out of Mrs. Barnard's hand. It was a pleasure to see them so fearless. I need hardly say there were no cats about. The birds had their nests about the garden, and even the wild ones, like the Barred-shouldered and Peaceful Doves, seemed to prefer living about the house to being out in the scrub, and they also grew very tame, feeding on the verandah with the others. At the back of the house were some pretty little bantams, a pair of Wood Ducks, and some smaller birds, and on the still waters of a waterhole close by the house were a pair of Black Swans, who jealously drove away any geese that attempted to enter the water near them. On the branches of an old dead gum tree which had fallen in the water were generally to be seen a few Plotus Birds (*Plotus novae-hollandiae*), and Little Cormorants

(*P. melanoleucus*), the former often uttering their curious cry. A little further away from the house ducks used occasionally to come and feed among the water lilies, which at this time of the year nearly covered the water, and their light-blue flowers had a very pretty effect. A pair of Whistling Eagles had built three nests, at different times, on a high gum tree near the water about 300 yards from the house, and a pair of young birds had just left the nest and were learning to forage for themselves. On one occasion Mr. Barnard took their eggs and placed some guinea fowls' eggs there instead; but although the birds sat on them, they did not succeed in hatching them. Some hens' eggs are to be placed in the nest at some future date, and it will be interesting to see how the foster parents will treat them when hatched, as they have a weakness for taking chickens to feed their young on, and also to eat themselves, when they have the chance. This pair of birds have been living there for some years, and they carry off any stray pieces of meat or fat they find lying about. On a dead branch just over the water the lively Black and White Wagtail was rearing its brood of three little ones. A Restless Flycatcher, or Shepherd's Companion, also had its nest on a neighbouring tree, well out of reach, and on a box tree close by the small, open nest of the *Campéphaga humeralis* was discovered at the end of a thin bough. Mr. H. Barnard climbed up, and, fastening a spoon on the end of a long stick, carefully lifted the two eggs out, one by one, and brought them safely down. The creek near the homestead was not running at the time I was there, but there were several deep waterholes in it, and on one occasion we went fishing and caught several perch and some large eels. Another fair-sized fish, called the Jewfish, is often caught here, but I did not see one. On our return we saw a pair of Bee-eaters flying about, so we looked about for their nest, which was soon found; it was a small hole in the ground, with a large chamber at the end, and contained four white eggs. In some long grass we disturbed what is called the Pheasant Cuckoo, but it breeds very early in the season, and, although a cuckoo, makes its own nest in a thick bunch of long grass and lays three white eggs. A Sulphur-crested Cockatoo also had its nest in a hole high up in a gum tree near where we were fishing, and the dogs discovered a bandicoot, but in their excitement lost it in the long grass. Kangaroo Rats were also plentiful about here, and the blacks brought in a young one alive; a bush rat is also caught in traps occasionally, being much darker in colour than our imported variety.

After having spent a pleasant fortnight at Mr. Barnard's home, I left, in company with Mr. H. Barnard, for Townsville. On the drive in the early morning to the railway station, some 15 miles, we nearly drove over a Brown Snake, but it was too

quick for us, and escaped into some long grass. Several belts of Brigalow and Rosewood scrub were passed through. The wood of these trees is very hard ; the natives use the latter for making their weapons of, and on many of the trees marks could be seen where they had cut out boomerangs, &c.

We arrived at Rockhampton in the afternoon, and next day, as the steamer was not leaving till the evening, we took a long walk through the dry hot scrub on the other side of the river. We caught and killed a Brown Tree Snake (*Dipsas fusca*), and found several chrysalides of butterflies, but they all had ichneumon grubs in, which when hatched had more the appearance of a small bee than an ichneumon. The little Peaceful Doves were fairly plentiful, but their nests were difficult to find.

A large flock of Magpie Geese also flew over us during the day, and we were told that they were very numerous in the waterholes and rivers not far from the town. We camped for lunch on a staging erected over a well, and were amused watching the antics of a Dollar Bird, which evidently had its nest in our neighbourhood. It kept up an incessant chatter, and went first into one hole then into another in the gum trees near us, but carefully abstained from going into the one where its eggs or young ones were ; going into one hole it disturbed a Sacred Kingfisher, which came out in a hurry. Below us, on a small Casuarina bush, we espied a Brown Tree Snake, lying along the topmost branches, apparently asleep, but a Laughing Jackass alighted on a tree close by and uttered its curious note. The snake heard it too, and raising its head took a firmer hold of the branch, and remained in that position until the bird flew away, which it did about twenty minutes afterwards, making for an old dead gum tree, and struck a Lace Lizard which was lying on the branch and nearly knocked it off. We dislodged the snake by throwing sticks at it, when it took refuge in a clump of grass near the water's edge, where we left it undisturbed. On starting back to the town we passed by a small swamp, and several pairs of Grallinæ were nesting in the Melaleuca trees. When near the banks of the river we saw an empty nest of the Whistling Eagle ; the young had evidently flown. This bird was plentiful along the coast, and those not disturbed soon get tame. We got back at 5 o'clock, and then went on board the small steamer which was to convey us down the river to the larger one. A few waterfowl showed themselves on the banks and mud flats as we passed along. We were informed by the person in charge of the Quarantine Island, near the mouth of the river, that on the island there are two kinds of Wallabies, besides snakes, lizards, Talegallas, Curlews, and other birds, although the island was very small, and separated from the mainland by a channel about half-a-mile wide. He was greatly troubled by Carpet Snakes destroying his chickens at night, as

they get through the wire netting, but when they have swallowed two or three chickens are generally too bulky to get out again, so are easily killed.

We changed into the s.s. *Gabo* about midnight, and as we steamed up the coast had a good view of the well-known Whitsunday Passage, as we passed through it a little after daylight, and the reflection of the island on the mirror-like surface of the water was very beautiful. The steamer called at Mackay, and we reached Townsville on Saturday evening. Next morning we walked, or, rather, scrambled, to the top of a high rocky hill close to the town which is about 500 feet high. A very extensive view is obtained from the summit, showing a large extent of low-lying country near the town. About six miles out are chains of rocky hills covered with timber, but no scrub was visible, and away in the distance could be made out Alligator Creek, a noted place for wildfowl and Crocodiles, or, as the latter are always called in Queensland, "Alligators." On the hill on which we were standing the stunted Eucalyptus was growing, with a few coral trees. The small green cicadæ were very plentiful, and very noisy; a few butterflies were also seen, but only common varieties. We returned by the sea beach, and on passing a small lagoon near the town saw on it some Whistling Ducks. Shells, as far as we could judge, were scarce.

The day following we visited Acacia Vale, a large nursery and fruit garden, about three miles out. While there we caught a Brown Snake and killed it with nicotine from a tobacco pipe. We were told that the cats here occasionally kill venomous snakes by striking at them with their paws until they tire the snake out, and then, watching their chance, bite them on the back of the head and so kill them; Lace Lizards are also said to kill small snakes. We heard that a Carpet Snake 22 feet long had been killed shortly before we arrived close to the town. They had here a fine young specimen of the Queensland Cassowary, but, like other specimens of its tribe, it could only be trusted when one was on the other side of the fence. A small waterhole at one side of the garden was covered with the blue-flowering water-lily, which grows wild here and is to be seen on most of the lagoons and waterholes.

We left the same evening for Cardwell, by the small steamer *Burdekin*. Our first call was at Dungeness, a small township built on the banks of the eastern entrance to the Herbert River; and as it was high water we went up the river to the township, fastening the steamer to the Mangroves on the bank. We were soon away again and passed up Hinchinbrook Channel, formed between Hinchinbrook Island and the mainland. The scenery on the island is very fine, being mountainous and rugged, and several of the peaks are over 3,000 feet in height, often being hidden

by fleecy clouds. There is, also, a waterfall at the south end of the island, fed by a lagoon at a considerable height above the sea level. Many of the hollows are filled with dense scrub, and graceful palms are seen above the creepers and other vegetation. At other places the ground is covered with ferns, while the mountain sides and tops are frequently bare, or covered with a very short kind of herbage, with large boulders of granite showing here and there, and often little rivulets trickle down the sides. The island is twenty-eight miles long, but too mountainous to be made much use of; a few blacks live on it, and some Europeans at the south end. Several small islands were passed in the Channel, which added to its picturesqueness. We saw a flock of Torres Straits' Pigeons and a few White Cockatoos, and also a pair of White-bellied Sea Eagles. We arrived at Cardwell during the afternoon; it is situated close to the beach, on the mainland, facing the north end of Hinchinbrook Island. About two miles away to the back of the town are high hills, covered with timber, and dense scrub grows in the hollows. It is on the table-land, at the back of these mountains, that the Tree Kangaroo is found, and generally in the most thickly timbered country. Crocodiles are said to be numerous here, and both the Europeans and the blacks get any number of eggs in the laying season, which is in December. We, unfortunately, were too early for them, but got some of last year's eggs given to us. During the evening we took a walk through the scrub in the neighbourhood, but found the country very dry and insect life consequently very scarce.

At daylight next morning we were out again, and found that two Dugongs had been caught in the nets during the night. We went to the fisherman's hut and found that he had just skinned them, and the blacks were busy cutting up what he did not want of their carcasses and taking it away for food. They left very little, taking even the intestines, which they washed in the sea. The hide of these animals is very thick and smooth outside, and often has barnacles growing on it; and the Dugong, in its efforts to get these off, rubs itself against the sharp oyster-covered rocks and covers itself over with deep scars. They feed on the marine vegetation growing in the shallow waters near the coast, and a permanent net is set in their haunts, which when they strike they seem to try to push through and so become entangled and caught, and if they cannot reach the surface to breathe, soon drown. After being skinned, their body is boiled down for oil, and a good fat animal yields about two gallons. The males have short tusks, of which we were fortunate enough to obtain a pair. At breakfast that morning we had Dugong steaks, but as the flesh has to be eaten as fresh as possible, we found the meat rather tough; it has a peculiar taste, which one would have to get accustomed to to like. During the morning we again went for a

walk through the bush, and succeeded in obtaining a Tree Snake (*Dendrophis bilorealis*) and a few beetles. We saw some natives who had just returned from Herbert Vale, where they had been having a fight with another tribe, but no one appeared to have been much hurt.

About midday we left by steamer for one of the North Barnard Islands, about 40 miles distant. On the way several islands were passed, and near Dunk Island we saw a small sandy islet, which was covered with terns nesting. About 5 o'clock we were landed at our destination, and we pitched our camp on a small patch of coral strand, which was formed on one side of the island ; whilst close behind our humpy was a small patch of light scrub and some Screw or Pandanus Palms, under the shade of which we had our meals. We got everything fixed up before dark, and also watched the Torres Straits Pigeons (*Carpophaga luctuosa*) coming from the mainland to roost. They came across to the islands in small flocks, varying from half a dozen to about twenty birds, there being a continuous flight for about an hour and a half. The numbers that were roosting on the island must have numbered many thousands, and when the steamer blew its whistle as it passed by, a white cloud of birds rose up, and as they settled again the dark-foliaged trees looked as if they were covered with large white flowers. It was a remarkable sight; and worth coming a long way to see : the vegetation on the island was full of pigeons, and the cooing of so many birds was like one continuous sound. The male birds frequently made a curious clucking kind of noise, and also fought a good deal among themselves. The north group of islands, on which we were, consists of three fair-sized and one very small island, all within half a mile of one another, but as there is no permanent water on them they are uninhabited. On the South Barnards, however, six miles away, there is a permanent freshwater spring, and a bêche-de-mer fishing station is established there. Shortly after sundown we saw a few Flying Foxes flying very high in the air towards the mainland. These were soon followed by others, and directly after, as far as we could see, hundreds of thousands of them were passing over us, and the flight continued until it was too dark to see any more ; they also evidently had their camping ground on one of the numerous islands not far distant. What a large quantity of fruit it must take to feed such a number. A few came to our island, and we heard them fighting and squealing in the scrub during the night, but it was impossible to obtain a specimen, as we could not get through the scrub after dark. During the night we were occasionally disturbed by mosquitoes and also by the Long-haired Rat, a few of which are on the island, and everything had free access to us through the leafy covering of our humpy ;

cockroaches were also numerous. We were up at daylight next morning and saw the tail end of a flight of Flying Foxes returning to their camp, also the pigeons returning to the mainland. We found the island was apparently a hilltop, about 400 feet high, and rising abruptly from the water with steep rocky cliffs. All round the water line are huge broken boulders and large fissures and caves in the rocks of the island, looking as if volcanic action had been rampant in years gone by. The whole island is covered with dense scrub from the water's edge to the summit; some of the cliffs are covered with masses of ferns and in the sheltered hollows grows the Screw Palm (*Pandanus*); on the top Ficus and other trees grow, but mostly tangled together with the Lawyer Vine and other creepers, making it most difficult to force one's way through, and impossible to go quietly enough not to disturb the birds. Most of the trees and shrubs are fruit-bearing and the ground more or less covered with fallen seeds and fruit. The Bird's-nest Ferns are plentiful and attain a very large size. A few of the shrubs and creepers were in flower, but we saw very few butterflies or beetles, it being probably too early for them. We soon commenced our scramble over the island, and in the scrub, just behind our humpy, we saw a pair of the Victoria Rifle Birds and not far from them was a fair-sized nest made of grass in a small tree. Our hopes rose high, as one of the objects in visiting these islands was to try and find the hitherto undescribed nest and egg of this beautiful bird. One of us carefully climbed up to the nest, but found that it belonged to a Torres Straits Pigeon, and we soon found that those birds were breeding all over the island. They seem to build anywhere—high up in the trees, low down on the vines, and occasionally on the rocks or in the Bird's-nest Ferns growing on the ground. The nests vary in size from a light structure composed of a few sticks to large bulky ones built of twigs with the green leaves left on. The only pigeons that seem to remain on the island during the day are the hen birds which were either sitting or attending to their young. We found eggs, one only in each nest, in all stages of incubation, and also young birds. We reached the top of the island after a difficult climb, frequently having to crawl under masses of vine and tangled brushwood, and often disturbing colonies of green-headed and other ants, and they made the most of their opportunity in attacking us, the bite being very painful. At the summit we found the ground a little more clear of undergrowth, and there came upon a large mound of the Megapode; it was 7 feet in diameter and 3 feet 6 inches high in the centre, and contained about three cartloads of earth, leaves, and sticks. We were soon on our hands and knees scraping it out, but only found three fresh eggs; the temperature was 94 degrees, and the nest had evidently been used for some

time and scraped out and renewed every year as the breeding season came round. I was told that the Talegalla also used the same nest renewed year by year the same way. We shortly after found another nest, but it was on the steep side of the island, and was kept from going down hill by a Ficus tree, as the sticks and leaves had been scraped into a hollow formed on the upper side by two roots, but the mound was very small, being about 18 inches in diameter; no heat was generated, and only one fresh egg was taken out. While quietly watching birds in the scrub, the Megapodes came quite close to us, and their note was very similar to a young cockerel trying to crow. They roosted at night on the topmost branches of the trees, one having its roosting place close to our camp. We saw no snakes in our rambles, and only one small lizard, which we caught on the beach just above high water mark. We got back to the camp about eleven, and again noticed the pair of Rifle Birds in the scrub close to us; they seemed very fearless, the hen bird especially so. We left again during the afternoon and scrambled over the island, still searching for the nest of the Rifle Bird. A fair number of the birds showed themselves, but it was a difficult thing to discover any nests in such thick vegetation, and we thought our task a hopeless one. Once we came across a large nest built of leaves, and, thinking it might be the one we wanted, one of us sat down a short distance away and watched it quietly to see if any birds came to it. A male Rifle Bird soon put in an appearance and uttered its grating kind of note. It clung to a vine and went through all sorts of antics, one favourite position being to stretch its expanded wings above its head until the tips touched, and then hiding its head behind them and bending its body from one side to the other. After going on for about a quarter of an hour it flew away, and a Black Butcher Bird (*Cracticus quoyii*) alighted close to the nest and after some time flew on it, and on driving it away and climbing up to the nest it was found to belong to a pigeon, and had an egg in it, which the Butcher Bird had apparently just broken. It is evident that during the breeding season these birds must destroy a large number of the pigeons' eggs, as we often found broken eggshells on the ground which had not been hatched. One of the birds was shot for a specimen. Shortly after returning to the camp, we again heard the female Rifle Bird near us, so determined to watch her movements. Mr. Barnard went to one side of the small patch of scrub and I went to the other; we soon saw the bird with a piece of moss in her mouth, which she kept dropping and catching again before it reached the ground; but after we had remained quiet for some time she darted into the scrub near to Mr. Barnard, and a few minutes afterwards he came round to where I was stationed and asked me to look in the crown of

the Pandanus Palm under which we had our meals and kept our luggage. On going carefully round I saw the head of the bird as she sat on her nest, but the nest itself was so well hidden that it could not be seen ; yet it was only nine feet from the ground. The tree was about six feet from our humpy, so every time we had returned to our meals we must have frightened her off the nest into the scrub, which accounts for our having heard and seen her so often ; but she sat very close the second day, and was evidently getting used to us. We did not disturb her that night, and presumed she would have three eggs, and discussed what would be done with the odd one ; but next evening, when we took the nest, we found there was only one egg in it, and on blowing it found that it had been sat upon for about a week, and that when the bird was carrying about material in her beak, and making us think she was only building it must have been with the intention of misleading us. There was a small island about half a mile away from us, on which we could see hundreds of Terns, and they evidently had their rookery on it. We made a kind of raft with what dead wood we could secure, and early in the morning when the tide was out Mr. Barnard tried to get across, but the current was too strong in the centre of the channel and he was obliged to give up the attempt. We picked up a few shells on the beach, principally Cones and Cowries, but as the spit of the low land we were on was composed solely of broken-up coral, most of the shells were very much waterworn and broken, and we were surprised to find the few shells we got as perfect as they were. Most of the rocks below high water mark were thickly covered with small oysters, and very sharp we found them. We spent the day in searching over the island, and found another large Magapode's mound close by the beach, but no eggs in it ; we were evidently rather early for them. We were surprised to notice so few species of birds on the island, as the mainland was only about three miles away. We saw the Torres Straits Pigeon (*Carpophaga luctuosa*), Megapodes (*Megapodius tumulus*), Rifle Birds (*Ptilorhis victoriae*), Butcher Birds (*Cracticus quoyi*), one Sulphur-crested Cockatoo, one small Kingfisher (*Alcyone pulchra*), one pair of Honey-eaters, and a few yellow Zosterops (*Zosterops luteus*). It is quite possible that the large number of pigeons kept many other birds away. During the evening we stood on the beach and shot two dozen pigeons as they flew past, as we had promised to get some for the captain of the steamer that was to call for us that night. We then packed up our things, and after dark made a fire on the beach to show our whereabouts. The steamer came at twelve o'clock, and we were soon on board, but Mr. Barnard was landed again on the South Barnard Island, where the fishing station was, as he was anxious to visit the tern rookeries, and would be able to do so in one of their boats. I came on to

Townsville and there changed into a larger steamer and proceeded in her to Brisbane. While in that town I passed a fruit shop on Sunday morning in the main street, and saw just inside the window a large rat busily occupied in catching flies, which were numerous. He was not in the least frightened at the half-dozen people and a dog looking at him, and seemed to know he was quite safe behind the glass. The dog had its nose up against the window, but the rat, although passing close to it, took no notice. Later on during the day I passed the same shop, and again saw the rat sitting quietly close to the glass and looking perfectly satisfied. I saw no flies either, so presumed he had eaten them all. I wish other rats would develop the same taste.

When I left Melbourne the Pallid Cuckoo was very numerous all over Victoria, and wherever I stopped on my journey north one of the first birds I heard was the same cuckoo; thus it appears equally numerous in Victoria, New South Wales, and in parts of Queensland, even as far north as Townsville. While in Queensland I made inquiries from Mr. Barnard and others respecting the sounds made by the Podargus and Boobook Owl, and, from what I can gather, the Podargus generally makes a low hooting kind of sound; but Mr. C. Barnard once heard one utter a long drawn-out note which sounded something like "Morepork." The bird was close enough to him to enable him to identify it, but the sound was quite different from the quicker cry of the Boobook Owl, which is so often mistaken for the Podargus. Personally, I have never heard the latter bird utter any sound except the hooting before referred to, although we have had them in captivity for years.

Specimens of most of the things collected during my trip are on exhibition here this evening, including the nest and egg of the Victoria Rifle Bird.

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#### NOTE ON ANTHOLOMA.

BY BARON VON MUELLER, K.C.M.G., M. & PH.D., F.R.S.

WHILE elaborating diagnoses of new Papuan plants, I was pleasingly surprised to find among the novelties an Antholoma, which genus was hitherto supposed to be restricted to New Caledonia. The Papuan species is dedicated to Professor van Tieghem, the renowned Phyto-Anatomist of the Paris-University. The denticulation of the leaves, the elongation of the setule of the anthers and the three-celled ovulary already separate *A. Tieghemi* from *A. montanum*. Among the novelties are also *Oxalis (Biophytum) albiflora*, *Sloanea Forbesii*, which approaches *S. quadrivalvis* in many respects, but is petaliferous, and *Quintinia Macgregori* as particularly remarkable.

December, 1891.

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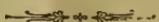
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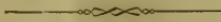
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MARCH, 1892.

# The Victorian Naturalist:

THE JOURNAL AND MAGAZINE

— OF —

The Field Naturalists' Club of Victoria.

PUBLISHED MARCH 4, 1892.

Editor: A. H. S. LUCAS, M.A., B.Sc.

The Author of each article is responsible for the facts and opinions he records.

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VOL. VIII.—No. 11. MARCH, 1892.

No. 99.

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FIELD NATURALISTS' CLUB OF VICTORIA.

THE ordinary monthly meeting of the Field Naturalists' Club was held in the Royal Society's Hall on 8th February. Mr. C. Frost (one of the vice-presidents) was in the chair, and there was an attendance of some 50 members and friends.

LIBRARIAN'S REPORT.

The hon. librarian reported the receipt of the following donations to the library:—"Proceedings of the Academy of Natural Sciences, Philadelphia," part ii., for 1891, from Society; "Proceedings of the Institute of Natural Sciences, Nova Scotia," vol. vii., part iv., from Society; "Journal of Pharmacy," January, 1892.

REPORT OF EXCURSIONS.

Mr. J. Shephard brought up a report of a recent excursion of the Club to Heidelberg. Pond life was the object in view, and "dippings" from the lagoons near the Yarra revealed the presence of numbers of the charming Volvox, a good many species of Rotifera and Vorticellæ, as well as specimens of the brown and green Hydra, the rare chance of finding the latter falling to Mr. G. J. Page, of Collingwood.

A report of the Nar-nar-goon trip was read by Mr. C. Frost, and recorded the finding of a good number of snakes, lizards, frogs, spiders, nemertine and planarian worms. Amongst the lizards was *T. albonotata*, a species never recorded before within 200 miles of Melbourne; and the land planarians furnished a good many examples of *Geoplana dubia*, a form, according to the authority of Dr. Dendy, hitherto only found at Narre Warren, South Gippsland.

ELECTION OF MEMBER.

On a ballot being taken, Mr. Donald C. Campbell was elected a member of the Club.

PAPERS.

The first paper was contributed by Mr. C. French, F.L.S., and consisted of a third contribution to the subject "Insectivorous Birds of Victoria." The examples treated were the Laughing Jackass, Australian Bee-eater, Silver Gull, and Nankeen Kestrel; and the plea for their protection was earnestly advocated. Stuffed specimens, together with eggs, all from the entomological depart-

ment, were shown in illustration of the paper. Mr. T. Steel, F.C.S., in speaking on the subject of bird protection generally, gave some interesting details as to the utility of the Jackass and Mynah to the agriculturist.

Mr. A. J. Campbell, F.L.S., brought up the next paper, which had reference to the protection of native fauna, the precise title of the paper being "The Advisability of Petitioning the Government to Impose a Gun Tax." Several reasons were given in favour of the imposition of such a tax, the principal ones being that it would be a legitimate source of revenue, would afford better protection to native fauna, and also save many useful lives. Mr. Campbell calculates that no less a sum than £20,000 per annum would result from such a tax. The subject gave rise to an animated discussion, in which Messrs. E. Anderson, W. Fielder, C. Frost, G. A. Keartland, J. E. Prince, J. Shephard, T. Steel, and R. S. Sugars took part, the majority being in favour of the tax; and that some steps may be taken for bringing the subject under the notice of the Government, Mr. G. Sweet, supported by Mr. J. Shephard, proposed that the following should form a committee to consider the matter, viz., Messrs. A. J. Campbell, C. French, C. Frost, F. R. Godfrey, G. A. Keartland, D. Le Souef, and F. Wisewould. This committee will be called together shortly, and will issue some suggestions on the subject.

#### THE PERMANENT PRESERVATION OF THE HERBARIUM.

The Chairman said that, as some anxiety had been expressed as to the future fate of the specimens at present in the Botanical Museum, the members would be glad to learn that a movement was on foot for bringing the subject prominently under the notice of the Government and the public generally. At a late committee meeting of the Executive of the Club a sub-committee had been appointed to give attention to the subject, and a letter addressed to the Council of the Royal Society, asking for co-operation on the part of their society. It was confidently expected that this co-operation would be afforded, and a strong representative committee formed, capable of viewing the subject in all its details, as well as of formulating means of arousing public opinion on the matter.

#### EXHIBITION OF SPECIMENS.

The meeting terminated with the usual exhibition of specimens, of which the following is a list:—By Mr. C. French, sen.—Mounted specimens of Silver Gull, Laughing Jackass, Nankeen Kestrel, and Australian Bee-eater. By Mr. C. French, jun.—Eggs of the Singing Honey-eater, Grey-backed Storm Petrel, Hoary-headed Grebe, Barred-shouldered Dove, Sordid Kingfisher,

and Red-winged Lory. By Mr. G. E. Hill.—Case of Coleoptera. By Mr. G. Keartland.—Tawny-shouldered Podargus, rare Sparrow-hawk. By Mr. J. Mitchell.—Case of mineral specimens. By Baron von Mueller.—*Cotula integrifolia*, from the Wimmera (new for Victoria); also, *Calochilus holtzei*, from North Australia (new to science). By Mr. J. E. Prince.—Perfect cast skin of Death Adder, from Fitzroy River, North Queensland. By Mr. J. Searle.—A Ring-tailed Opossum, and beetles, ants, &c., from the Grampians. By Mr. D. Le Souëf.—Eggs of Little Water Crake and the Downy Pycnoptilus. By Mr. G. Sweet.—Disodile (Tasmanite), containing permo-carboniferous marine shells, from Mersey River, Tasmania.

#### EXCURSION TO HEIDELBERG.

SEVEN members met at Collingwood station on the afternoon of Saturday, the 16th January, to take part in an excursion to Heidelberg in search of "pond life." The deficiency in numbers was fully compensated for by the enthusiasm of those present. All were intent upon work, six being provided with appliances for carrying out the special object of the day, the remaining member being a botanist and a country member of the Club; the presence of the visitor being a reminder that the influence of the Club extends beyond the immediate surroundings of the metropolis. On arriving at Heidelberg the party at once proceeded to the alluvial flats of the Yarra in the neighbourhood of the bridge. Here the lagoons are sinuous sheets of water quite cut off from the river when the latter is at its ordinary level, and are evidently old portions of the river bed, abandoned by the stream in the course of changes produced by the erosive action of the river, together with the reciprocal process of deposition. These lagoons are excellent collecting places for minute aquatic life, as they are permanent in character, probably never being quite dry, while periodically they are connected by floods, and thus the distribution of the inhabitants is secured.

The first place tried was a swamp on the right-hand side of the road on approaching the bridge; and, although uninviting enough to the ordinary eye, was of favourable appearance in those of the party, filled as it was with a luxuriant growth of aquatic vegetation. A few dips showed the presence of the brown *Hydra* and *Volvox*, the latter being unusually plentiful for the season. A cluster of rotifers adherent to the stem of a plant, and a similar one free, turned out on subsequent examination to be the adult and juvenile forms respectively of *Megalotrocha alboflavicans*.

The next place visited was a lagoon on the left-hand side of the road after crossing the bridge. Here a ciliate protozoon was

at hazard pronounced *Bursaria truncatella*, a form remarkable for its large dimensions, being easily visible to the naked eye, and also its constancy of occurrence in the shallows of this lagoon, underneath the leaves of the Azolla and other floating plants.

The third place worked was situate to the right of the Kew-road, about half a mile lower down the river than the bridge. Nothing of interest was noted on the spot; but here, as at other places, material was secured for the future microscopical examination so imperative if benefits are to be obtained by excursions of this character. The home examination showed the material obtained to be unusually rich in tube-building rotifers—*Cephalosiphon limnias*, *Limnias ceratophylli*, *Eociotes longicornis*, *E. crystallinus*, and *Melicerta ringens*, all occurring in numbers. One bit of weed presented to view four species of the family Meliceradæ within the field of a half-inch objective. Of free-swimming rotifers *Dinocharis tetractis* was the only one of interest noted. The distinct find of the day was made by Mr. G. J. Page, who among his gathering found a single specimen of a green species of *Hydra*. This was exhibited living at the last meeting of the Club, and is on view to-night mounted. The specimen is considerably smaller than the average size of brown *Hydræ*, and possesses six tentacles very regularly placed around the mouth, shorter than the body, and held straighter than is usual with the brown species. So far as I am aware, this is the first record of a green *Hydra* being found in Australia, and it is a source of satisfaction that these "pond life" excursions should so soon have resulted in the discovery of a new species of Hydroïda for Australia.

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#### NOTES ON THE INSECTIVOROUS BIRDS OF VICTORIA.—PART II.

By C. FRENCH, F.L.S., F.R.H.S., Government Entomologist.  
(Read before Field Naturalists' Club of Victoria, 11th May, 1891.)

#### ORDER VII.—*Grallæ.*

##### FAMILY—*Charadriidae.* Plovers.

###### *Œdicnemus grallarius* (The Southern Stone Plover).

THIS bird, the largest of the plovers, is found in most parts of the colony, although in the moister parts of Gippsland, &c., it is, as a rule, somewhat rare, but in the grassy plains of the Wimmera and other warm, dry places, this plover is by no means uncommon.

Being on a visit to the mallee country not far from Dimboola, and whilst crossing a patch of dwarf stringybark forest, I was

somewhat surprised to see quite a number of fine specimens of this very useful bird, and although in such a wild part of the colony the birds did not appear to be particularly shy. To those of us who have travelled in the Victorian bush the singular cry of this plover is too well known to need description here. When full grown a good male specimen, with head erect, will measure nearly two feet in height, the female being, if anything, smaller in size, and, as Mr. Gould remarks, "the markings and general appearance of the two sexes are so similar that is scarcely possible to distinguish the male from the female without the aid of dissection." For a popular description of this bird, it will suffice to say that the colour is brownish-white; belly and throat white; back a light brown with darker brown markings, often termed speckled; tail with barred markings, not unlike that of some hawks; legs long and feet leaden grey; eyes prominent. The young, two in number, are funny speckled chicks; eggs, two, deposited on the bare ground.

The specimen exhibited here this evening will furnish a good idea of the average bird, the young chicks having been kindly lent by Mr. A. Coles; eggs, from the collection now at the Museum of Economic Entomology.

This bird subsists solely upon insects, and the stomach is generally found crammed with either crickets, grasshoppers, or other pests.

According to Mr. A. J. Campbell the eggs are deposited from August to January.

The Southern Stone Plover, being so useful a bird, should be permanently protected, and, as in the case of other insect-eating birds, it should be made a punishable offence to either kill or expose them for sale.

This bird, when bringing up its young, resorts to somewhat similar tactics as those adopted by the English Partridge, viz., feigning to be wounded, and lying close amongst tussocks, so as to attract as little notice as possible.

In Mr. Campbell's very useful book on "Oology of Australian Birds" he mentions this plover as being found all over Australia, excepting in West, but Gould, in his "Handbook," vol. ii., page 211, mentions having had many specimens from Swan River. Mr. Gould also mentions the probability of a northern form of this species which has longer tarsi and shorter wings, but as I have not seen the latter bird myself I have not ventured an opinion on the matter.

The Stone Plover is often confounded by the colonists with the Australian Curlew, a bird with which, however, it has no affinity, and certainly little or no resemblance.

The specimen here exhibited is from the Wimmera district of Victoria.

ORDER VII.—*Grallæ.*FAMILY—*Ardeidae.* Herons.*Ardea Novæ-Hollandiæ* (White-fronted Heron).

This elegant bird is well known to frequent margins of lakes, swamps, and moist places generally, but is sometimes found far inland and away from water of any kind, although, properly speaking, it is a wading bird, its long legs being specially adapted for this purpose.

The White-fronted Heron is of a bluish-grey colour, with white breast and throat, the lower portion of the wings being blackish-grey. The neck, when erect, is very long, and which, when alarmed, it stretches out to the utmost.

A few weeks ago I purchased the specimen exhibited here this evening from Mr. Coles, who, upon examining the contents of the stomach, found therein no less than 57 specimens of the common black field cricket, an insect which of late has been making havoc amongst the orange trees, by ring-barking them near to the surface of the soil, and the specimens of crickets so found are here in spirits for your inspection this evening.

This bird should, without a doubt, be at once protected, as it is well known as a destroyer of insects and the smaller reptilia, including young snakes. As a bird for the table it is next to useless, being little else than a bundle of feathers, so that the numerous specimens sometimes to be seen hanging up outside fishmongers' shops must have been either shot by accident whilst duck shooting, or been killed, as our Yankee friends would say, out of "pure cussedness."

This heron is said by Mr. Campbell to be a most persistent breeder, as many as five clutches of five eggs each having been taken from one nest, and, notwithstanding, the bird succeeded in rearing a brood before the season expired.

Colour of eggs, which are laid in nests composed of sticks, generally placed in trees, are of a pale bluish-green, and very pretty.

It is to be hoped that the Zoological Society of Victoria, which all along have done such good work, will again use their influence to have this, as well as other birds yet to be mentioned, permanently protected from the "pot-shot man" and others.

Found, according to Dr. Ramsay, over nearly all Australia.

ORDER II.—*Passeres. Perching Birds.*FAMILY—*Caprimulgidæ.* Goat-suckers or Night-jars.*Podargus Cuvieri* (Cuvier's Podargus, or Mopoke).

A well-known and most singular-looking bird, of which genus Dr. Ramsay gives no less than nine species as inhabiting Australia. One, however, bearing the specific name of *papuensis*,

would appear to have been described from specimens obtained in New Guinea, but has been found at Rockhampton Bay and Cape York, both being in the far northern parts of Queensland.

These birds, as is the case with the whole family of night-jars, are, strictly speaking, friends of the farmer and fruit-grower—also to mankind generally—subsisting, as they do, entirely on insects (mostly night-flying kinds); also on mice, rats, and many of the reptilia.

The adult bird is a somewhat ugly-looking customer, about the size of a small pullet. Colour—brown, black, and grey; with a strong hooked beak and an enormous gape, which renders the bird capable of capturing even swift-flying insects whilst on the wing.

The young of the Mopoke is a queer, fluffy little creature (see specimen here exhibited), and the quantity of food which even a young one will eat is quite astonishing. The eggs (two in number) are white, and are deposited in a flat nest constructed of small sticks on the horizontal branches of trees, and are, as a rule, not uncommonly met with.

This species of Podargus, like other members of this large family of birds, are nocturnal in their habits, and to the traveller who, by necessity or otherwise, has to camp under the proverbial gum tree, the swift, heavy flight of the Mopoke is well known; and although the peculiar cry of "Mopoke" is well known (which noise, according to Messrs. Campbell, Le Souëf, and others, is not caused by this bird at all, as is supposed, but by the Boobook Owl, a much smaller bird), it cannot be mistaken for any other bird.

With regard to the peculiar noise made by the Podargus, there would seem to be a great difference of opinion, more especially as the celebrated ornithologist Gould tells us that a tame Podargus which he had in Tasmania used to perch upon the back of a chair and emit the cry of "Mopoke;" and although I have always been under the impression that the noise above mentioned was really made by the Podargus, I have no reason whatever to doubt the accuracy of the observations made by Messrs. Campbell and Le Souef. This is, however, a matter which I think requires some further investigation.

The Mopoke is a bird which, together with the Gigantic Kingfisher, or Laughing Jackass, ought to be protected at all hazards, as they are perfectly harmless and are two of our best friends, more especially to the forester, as many of his worst insect enemies are night-flyers, as Longicorns, &c.

The entomologist, however, does not find a friend in this bird, because he is robbed of what he is pleased to call his legitimate property.

Incubating months, from end of January to end of November, but principally September, October, and November.

Found also in South Australia and Tasmania.

NOTE ON THE GLACIAL BEDS NEAR HEATHCOTE  
By T. S. HALL, M.A.

(*Read before the Field Naturalists' Club of Victoria, 14th December, 1891.*)

WHEN one is visiting a locality for geological purposes there is always a difficulty, in the absence of a guide, in making the best use of one's time, and there is great liability of missing some of the best exposures. It is unfortunate that the Wild Duck Creek beds are so far from Melbourne, or, doubtless, we should have heard more of them than we have hitherto done. Sir R. Daintree was the first, I believe, to point out the glacial origin of the deposit, and, more recently, Mr. E. J. Dunn, of the Mining Department, has again called attention to the beds, and has contributed a paper on the subject to the Australian Association, which may be found in the "Transactions" for 1890. Anyone visiting the locality had better make Heathcote his headquarters, as no accommodation can be found nearer. In company with Mr. J. H. Craig, of Bendigo, I visited the beds, and got out of the train at Derrinal, about five miles on the Bendigo side of Heathcote. Mr. Hollingsworth, a farmer in the neighbourhood, has a fine collection of rocks from the beds, which he kindly allowed us to examine; and, in addition, guided us to some of the sections and directed us to others. Considerably more than a hundred feet of the beds are exposed, and the railway cutting on the right bank of the creek affords good opportunities of examining the deposit. The great mass of the beds consists of a dark grey clay, which, when first opened, is so hard as to require blasting, but which, on exposure to the air, readily crumbles away. On catching sight of the side of the cutting, as the train ran rapidly down the steep gradient to the creek, my first impression was that the rock was a decomposed basalt, with dense nodules in it; and though the idea was immediately dismissed, a closer examination, when we were on foot, showed a close resemblance on the part of the clay to that produced by the decomposition of such a rock as the older basalt near Melbourne, though the amygdaloid spots were absent. Thickly and irregularly scattered throughout the bed are masses of rock of all shapes and sizes, from sand up to several feet in diameter. Most of them are subangular, and well-rounded waterworn pebbles, though not absent, are, as far as our observations went, exceedingly rare. The pebbles and boulders are in great variety, and almost all are ground and scratched on more than one face. There are masses of granite closely resembling that of Mount Alexander in appearance; others, again, with glassy quartz and pink felspar in large crystals, the mica—black in some specimens and white in others

—being in small proportion. Dense dark sandstones, with silvery flakes of mica, spotted and mottled schists, occur, as well as a whole series of silicas. Mr. Hollingsworth's collection comprised lydianite, opal, jasper, chalcedony, and chert, as well as a beautiful specimen of mica schist and a mass of the siliceous breccia, which occurs, I believe, *in situ*, in the silurian rocks near Heathcote. Besides these, there is an almost endless variety of other rock, and I do not remember ever seeing before such a variety gathered in such a small area. To the north and east of the Derrinal railway station the deposit forms steep hills overlooking the creek valley. These hills are covered with masses of rock of all sizes. One mass of granite was measured by Mr. Craig and estimated to weigh about forty tons. The block is rectangular in form, and is referred to in Mr. Dunn's paper (*l.c.*) It is ground on several faces; but the top, as it at present lies, which measures 12 ft. x 14 ft., is flattened and smoothed in a very striking manner. The granite, which contains pink felspar, is very coarsely grained. Around it lie numerous other fragments of smaller size, and of various kinds of rock, and almost all show evidence of ice action, either as striations or as well-ground facets. The land above forms a plateau and has been ploughed. It is thickly strewn with rocks, which have been gathered into heaps in places, and afford good opportunities for collecting. In the creek bed, which is about a hundred feet below the plateau, the dark grey deposit is exposed in places where the river gravels have been removed. How far below this the beds extend vertically, I cannot say. Time forbade our visiting some of the localities we wished, and we did not attempt to trace the boundaries of the deposit nor study its relations for ourselves. It is stated to occupy a basin in the silurian rocks, and its age has long been a matter of conjecture, though it is older than the Bacchus Marsh sandstones. There is a geological survey party in the neighbourhood, and doubtless they will give some of their time to these beds. Mr. Dunn refers the age to the Trias, as he considers them comparable to the Dwyka beds of South Africa, which underlie fresh-water coal-bearing beds.

Though doubt has been thrown on the glacial origin of these beds by able geologists, both in years gone by and, more recently, at the Melbourne meeting of the Australian Association, no one, I think, who has been over the ground can doubt that floating ice has been the instrument of their formation. It is, of course, difficult for one who has not had the opportunity of examining the glacial deposits of the Northern Hemisphere to speak positively on such a subject; but the whole of the phenomena displayed so exactly agree with what the text-books tell us of the appearance of glacial beds that one must side with Daintree, Selwyn, and Dunn in the matter.

Mr. Dunn mentions the occurrence of agates and jaspers, and such-like rocks in the recent alluvial deposits in the Wooragee valley, near Beechworth, and states that they are derived from the denudation of a similar glacial deposit. In the valley of the Gellibrand, in many places, according to the "Progress Report of the Geological Survey," fragments of granite and other older rocks occur, and I had a beautiful specimen of schorl rock sent me from there a few years ago, to examine for tin. About two miles east of the river mouth there is a beach known as Pebble Point, on which pebbles of opal, jasper, lydianite quartz, and various porphyritic rocks occur, though I have not seen any granite. I have not seen the bed from which these rocks are derived, and I do not think it is exposed there at present. I regret that I cannot refer to the progress report here, but I do not think it mentions any glacial beds as underlying the coal measures of the district. It is possible, I think, from the slight evidence I have brought forward, that such is the case, and, if so, this would be the most southerly recorded occurrence of such a glacial deposit in Victoria.

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A CORRESPONDENT has forwarded the following extracts of letters received from Mr. E. M. Cornwall, Townsville, Northern Queensland, with regard to a certain peculiar trait in the character of the Bower Bird (*Chlamyodera orientalis*, Gould):—  
"I think I have discovered a new trait in the character of the Great Bower Bird. They are very plentiful about Roseneath Garden, and are very destructive to the various crops—chillies, paw-paws, granadillas, guavas, mangoes, green peas, &c.—in fact, every description of fruit suffers to a greater or less extent from their depredations. But their last object of attack proves them to be not entirely vegetarians, unless new-laid eggs are to be called vegetables. This is not mere supposition, but hard fact, for after noticing the disappearance of eggs in a most unaccountable manner for some time, the gardener kept watch, and was rewarded by seeing Mr. Bower Bird fly straight to a nest just vacated by a hen and deliberately pick the egg and polish off its contents." "In re the Great Bower Bird.—Since writing you last, I have had still further evidence to convict this rogue of what I charged him with. A bird was seen to fly right to a hen's nest in an empty shed and immediately emerge with an egg in his long claws; but the egg proved an awkward burden, and he dropped it ere he had gone many yards."

## THE ADVISABILITY OF PETITIONING THE GOVERNMENT TO IMPOSE A GUN TAX.

By A. J. CAMPBELL, F.L.S.

(*Read before the Field Naturalists' Club of Victoria, 8th February, 1892.*)

THE imposition of a gun tax has for some time been simmering in my mind. Last September I casually mentioned the subject to our Premier, the Hon. James Munro. He was perfectly in accord with the idea, and requested that a written communication should be sent him in the matter.

Although according to our articles as a club we exist for discussing subjects on natural history, for promoting observations in the field, &c., I think it is not beyond the province of this society to take a broader platform, if need be, in order to perform any signal good, such as being the means of promoting useful legislation.

Without further introduction, I apprehend there are three principal reasons why a gun tax should be imposed, namely :—First, it would be a just source of revenue; second, would lead to the better protection of native fauna; and third, would be the saving of many human limbs and lives.

1. *As a source of revenue.*—A nominal gun tax may be deemed just. A person cannot cut timber in any State forest or Crown lands without a license, nor can he prospect the same for gold or other mineral without a right; then why should he be allowed, even for sport, to shoot wallabies or pigeons in these domains without permit? Many other tangible reasons may be cited, and no genuine sportsman would object to be thus taxed.

2. *The better protection of native fauna.*—I think our indigenous birds and animals would undoubtedly secure better protection under a gun tax system, because one of the provisions of such an act would be to limit the age at which a youth could carry a gun. Certainly much native game is ruthlessly destroyed by thoughtless youths, who, it might be said to their credit, are not at all impartial in their dealings; for, alas! too frequently they "pot" themselves instead of their game. This brings me to my last and most important reason.

3. *The saving of limbs and many useful lives.*—Just read the list of shocking gun accidents that occurred during the late Christmas and New Year holidays, as detailed in the daily newspapers. I shall only touch upon three given in a single issue :—

"A youth named Herbert Wood, twelve years of age, met with a gun accident, whilst shooting rabbits, on Christmas Day, at Riddell's Creek. The injuries were of such a serious nature that the medical attendants at the hospital thought the unfortunate youth might have to submit to a surgical operation."

"A youth named Albert Bettens and a companion went to Lancefield Junction to shoot. The companion took aim, as he thought, at 'the game,' with the result, however, that the contents of the weapon entered Bettens's leg. The sufferer was taken to the Melbourne Hospital, and a large quantity of shot extracted from his limb."

"A youth named Alexander Brown was treated at the Melbourne Hospital on Saturday, suffering from a gunshot wound in the face. He and two companions were shooting at South Marong, when the gun carried by Brown accidentally exploded. Part of the charge lodged in his face, seriously injuring the right eye."

On my last excursion I came across a party of four or five boys with guns. It was Sunday, by the way. I asked them what they intended to shoot? "Oh, anything!" was the prompt reply. I had the curiosity to measure the smallest. He was only a few inches taller than the ramrod of the gun he carried. Now, if parents exhibit no better sense than this, it is high time legislation (grandmotherly let it be) should step in; and no youth, in the best interests of his own life, should be permitted to carry a gun under the age of, say, 16.

Of course, it is only the principles of a gun tax we would affirm here. Many other details might be gone into—the swivel gun, for instance. Legislation has failed to suppress that nuisance. It should be made an illegal act for any person to import or manufacture in the colony a punt gun or any such destroying instrument.

It may be of interest to know that the Cinderella of the Australian colonies, as Western Australia is called, is the only colony that has a gun tax, secured by "The Gun License Act, 1885." That measure, however, is only partial in its operations.

At present it is difficult to estimate the number of guns that could be taxed in this colony, but with a nominal annual fee of 5s., I daresay the amount of additional revenue would not be less than £20,000. There need be no extra cost for collection; the police or other Government officials now in existence could collect it. Perhaps the police would be better, because they would be in touch with every person who carried a gun in their respective districts.

DESCRIPTIONS OF NEW AUSTRALIAN PLANTS, WITH  
OCCASIONAL OTHER ANNOTATIONS;

BY BARON VON MUELLER, K.C.M.G., M. & PH.D., F.R.S.

(Continued.)

**PHYLLANTHUS HYPOSPODIUS.**

Tall, throughout glabrous ; petioles quite short ; leaves very large, almost distichous, chartaceous, ovate- or elliptic-lanceolar, thinly venulated, on the surface dull-green, beneath whitish-grey ; staminate flowers minute, on very short pedicels, each cluster accompanied by one or two pistillate flowers of larger size ; outer sepals almost ovate, inner more orbicular and slightly longer ; stamens six, their anthers roundish and nearly as long as their filaments ; style hardly any ; stigmas three, channelled or flattened, undivided, finally rigid ; fruit rather large, short-pedicellate, trigonous-globular ; seeds oblique-nephroid, but also somewhat triangular, smooth, outside whitish and faintly marked by a pale-brownish lineolation.

On the Russell-River ; Stephen Johnson.

Shrub, attaining a height of 14 feet. Leaves to 4 inches long and 2 broad, flat, entire. Sepals pale-coloured. Anthers disconnected. Ripe fruit measuring  $\frac{1}{3}$  inch diametrically, and quite as high as broad, many times longer than its sepals, brownish outside. Seeds nearly  $\frac{1}{6}$  inch long.

The whiteness on the lower page of the leaves as well as their form and size has our new species in common with the Sumatran *P. hypoleucus*, of which however the carpologic characteristics are very different.

**WENDLANDIA BASISTAMINEA.**

Branchlets appressedly almost seriously pubescent ; leaves on short petioles or almost sessile, chartaceous, mostly ovate-lanceolar, short-acuminate, at the base rounded-blunt, above nearly glabrous, beneath particularly along the costules and venules beset with very short hairlets ; stipules almost deltoid, incised at the apex, soon deciduous ; panicles with cymous or fasciculate flowers, appressedly short-pubescent ; lobes of the calyx deltoid-semilanceolar ; corolla-tube about thrice as long as the calyx-lobes, sparingly puberulous inside, slightly constricted at the upper end ; corolla-lobes nearly glabrous, not much shorter than the tube ; stamens fixed close to the base of the corolla and nearly as long as its tube, completely enclosed, as well as the style glabrous ; dehiscence of fruit more readily loculicidal than septicidal ; seeds minute, ovate, outside brown and reticular-rough.

On Russell's River ; Stephen Johnson.

Leaves simply opposite, to 5 inches long, to  $1\frac{3}{4}$  inches broad, flat, paler and often brownish beneath. Panicle terminal, inclusive

of the peduncle seldom above 2 inches long. Pedicels to  $\frac{1}{3}$  inch long, but often much shorter. Bracts minute, linear-semilanceolar. Corolla hardly  $\frac{1}{4}$  inch long, its lobes five, oval, distinctly imbricate, but only slightly twisted before expansion. Filaments very short. Anthers comparatively large, fixed above the finally bi-lobed base, upwards narrowly ellipsoid. Fruit about  $\frac{1}{6}$  inch long and nearly as broad, slightly protruding beyond the calyx-tube, short-pubescent at the summit. Placentaries expanded into two narrow divaricate plates. The blunt-based leaves, the short panicle with flowers more conspicuously pedicellate and the corolla-tube thickest towards the middle distinguishes this species already from the majority of its congeners, whereas the situation of the stamens separates at once the Australian one from all others, unless—as in *W. psychotroides*—a dimorphism should occur also in this new Wendlandia, the state with exserted stamens then yet remaining unknown.

The discovery of a Wendlandia as Australian does not come altogether unexpectedly, because I had previously shown the genus to occur in New Guinea; the species there, *W. buddleacea*, is however very different from that of Queensland just described in the form of its leaves, in the disposition of its flowers and in the placement of the stamens, though the corolla is similar as well in shape as in size; but the only Papuan species, as yet known, may be identical with one of the Indian, although seemingly not with *W. paniculata*, to which De Candolle adscribes nearly sessile leaves and Sir J. Hooker rounded calyx-lobes. Nevertheless the variability of the species of Wendlandia may be far greater, than hitherto admitted, particularly also through biformous flowers; indeed these plants can effectually be dealt with for fixing their diagnoses only by studies in their native homes, the carpologic characteristics deserving also yet closer attention.

To the genus Wendlandia as a second Australian species is referable *Oldenlandia psychotroides*, as I now find the preflorescence of the corolla-lobes to be broadly imbricate. It is remarkable among congeneric plants already for the broad yet very short tube of the corolla, barely as long as the lobes. The reliable generic differences between Rondeletia and Wendlandia require also yet further to be contrasted.

#### WRIGHTIA BACCELLIANA.

Branchlets densely beset with spreading hairlets; leaves on very short petioles, from subcordate- to lanceolar-ovate, seldom quite lanceolar, narrowly acuminate, above scantily but beneath more copiously bearing short hairlets; flowers rather small, in axillary and terminal short cymes, occasionally only three together or even fewer, extensively beset with short spreading hairlets; segments of the calyx lanceolar, pointed, devoid of conspicuous

inner appendages ; corolla red, its tube hardly reaching beyond the calyx, its lobes glabrous, about equal in length to the tube, orbicular- or cordate-rhomboïd ; coronula divided into numerous linear- or spatular-elliptic and glabrous segments ; stamens fixed above middle of the corolla-tube, perfectly enclosed ; anthers disconnected ; pistil glabrous, the stigma nearly as long as the style, ovate-conical, annular-turgid at the base, bi-mucronulate at the apex.

On Russell's River, in forests of *Agathis Palmerstoni* ; Stephen Johnson.

Branchlets rather robust, somewhat laxly spreading, their indument greyish. Leaves of firm texture, to 5 inches long, to 2 broad, the primary venules beneath prominent. Cymes seldom above 1 inch long, usually paired when axillary. Bracteoles narrow and pointed. Flowers ornamental, probably fragrant. Calyx about  $\frac{1}{4}$  inch long, its form unusual within the genus. Tube of the corolla pubescent outside, much narrowed downward, constricted at its termination ; lobes amply overlapping each other. Segments of the five coronular lobes fascicled in several rows. Filaments very short. Anthers yellowish, glabrous, gradually pointed, minutely bi-lobed at the base, about one-tenth inch long. Fruit as yet not obtained ; nevertheless the place of the plant in the genus, to which it has been allotted, seems hardly doubtful, though the position of the anthers is abnormal, so that a generic division or perhaps full genus (*Endostemon*) might be constituted for placing this plant systematically. The unappendiculate calyx and the enclosed anthers pollen-bearing to the base would bring this plant to *Melodinus*, as a species of which I have distributed it ; but the venulation of the leaves does not accord, and the coronule is more developed. The generic position can finally be settled only when the fruit shall have been discovered.

Nearest to *Wrightia coccinea* in regard to the colour of the corolla, but that congener differs already in glabrous somewhat narrower and more gradually acuminate leaves, much larger and less numerous flowers, blunt calyx-lobes considerably exceeded by the corolla-tube, and only slightly divided coronular lobes. The general aspect of the plant is like that of *W. tinctoria*, which is however at once distinguished by frequent want of vestiture, by a white corolla with much narrower and longer lobes, also by a proportionately shorter tube.

This species of a medicinal genus of plants is offered from here as a floral homage to the clinical Professor Bacelli, in commemoration of the leading part taken by this great pathologist in the recent International Medical Congress of Berlin, and further for also phytologic felicitation in his so worthily being called to the high presidential office of the forthcoming universal gathering in Rome.

## CALOCHILUS HOLTZEI.

Rather tall; basal leaf elongated, stem-leaves usually three, very much shortened or bract-like; raceme long, with numerous flowers; pedicels soon somewhat longer than the bracts; lower calyx-lobes ovate-lanceolar, the upper one usually broader, verging into a deltoid-roundish form; lateral petals obliquely lanceolar-elliptical, fully as long as the calyx-lobes and with these lightly greenish-brown; labellar petal doubly as long as the others, rhomboid-ovate, undivided, greenish, above densely beset and also ciliolar-fringed with reddish hair-like papillules, but glabrous at the deltoid apex, bearing near the middle of the base two straight vertical dark-bluish plates with prominent dark strioles between them, but devoid there of glandules and of any protruding cross-line; gynostemium by about one-third shorter than the calyx-lobes; anther somewhat contracted upwards; rostellum semiovate, conspicuous; fruit ellipsoid.

Near Port Darwin; M. Holtze.

Height, to 3 feet. Tuber nearly  $1\frac{1}{2}$  inches long. Basal leaf 4-10 inches long,  $\frac{1}{4}$ - $\frac{1}{3}$  inch broad. Flowers to 20 in the raceme. Pedicels  $\frac{1}{3}$ - $\frac{1}{2}$  inch long, or at last even longer. Bracts ovate-lanceolar, acuminate, incurved. Calyx-lobes about  $\frac{1}{4}$ -inch long. Labellum glabrous at the base. Ripe fruit measuring fully  $\frac{1}{2}$  inch in length, slightly broader towards the summit. The first representative of the genus from intra-tropical regions. It comes nearest to *C. paludosus*, but it is a larger plant, has a raceme from 1 to  $1\frac{1}{2}$  feet long and a deltoid termination of the labellum, irrespective of the longer pedicels and of the petals equalling in length the calyx-lobes, in which respect this new congener differs also from *C. campester* and *C. Robertsonii*. Nevertheless, the specific limits of these plants have yet further to be traced by field-studies. *C. Robertsonii* extends to the Snowy River (John Cameron), the sources of the Werribee (Miss Champ), Maclarens Vale (Miss Aldersey), Mt. Loftus (Tepper). *C. campester* occurs also at Port Arthur (Hon. Dr. Dobson), and the Freeman River. *C. paludosus* advances southward to Ulladulla (Baeuerlen). Mr. Holtze's last sending afforded also an opportunity of ascertaining the characteristics of the pollinia in what was lately described as *Eulophia Holtzei*; thus it becomes now clear, that this plant requires to be transferred to the section Apaturia of *Pachystoma*, the genus being new for Australia. The base of the gynostemium protrudes distinctly across the summit of the ovary, and for this reason also the plant is better brought under that genus than under *Spathoglottis*. The short rather thin and almost horizontal rhizome, further the less spreading calyx-lobes and petals, the form of the labellum, as also the much reflected fruit-pedicels, agree all best with *Pachystoma*—indeed, our plant is in many respects not unlike *P. pubescens*.

February, 1892.

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President:

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VOL. VIII.—NO. 12.

APRIL, 1892.

# The Victorian Naturalist:

THE JOURNAL AND MAGAZINE

— OF —

The Field Naturalists' Club of Victoria.

PUBLISHED APRIL 8, 1892.

Editor: A. H. S. LUCAS, M.A., B.Sc.

The Author of each article is responsible for the facts and opinions he records.

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VOL. VIII.—No. 12. APRIL, 1892.

No. 100.

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FIELD NATURALIST CLUB'S EXCURSION TO THE  
GRAMPIANS, 21ST NOVEMBER to 5TH DECEMBER,  
1891.

THE Grampians are three chains of hills running north and south, the southernmost point being at Dunkeld, where they end very abruptly—whence the appropriate name of Mount Abrupt. They comprise the three ranges, Mts. William, Serra, and Victoria, and the valley between the first two is known as Hall's Gap, the nearest rail township to the entrance of which is Stawell. To the geologist they are known as Upper Paleozoic, and there are also in one or two spots small quantities of granite. The country is mostly pastoral, but of late more attention is being given to agriculture, especially fruit-growing, for which the valleys are unquestionably suitable.

This—Hall's Gap—was the locality selected for the now recognized annual Club excursion, and for which seven members had put down their names, as also a preliminary deposit of cash to ensure their adherence to their promises. As a result all the seven were *en evidence* at Stawell on the morning of Saturday, 21st November, together with the useful Fred, who was the cook and general utility man who accompanied the party of last year. One of our first duties was to call upon the Mayor—Mr. Edhouse—with a letter of introduction kindly given to us by Mr. Perrin the Conservator of Forests, but he not being at home we presented it to the Town Clerk, who received us most courteously, and after reading the contents handed it to Mr. Henderson, the Superintendent of the Waterworks, who readily complied with the purport of Mr. Perrin's request—viz., to grant us the use of what is locally known as the Borough Hut, situate some distance up the Gap. This hut we found most useful, and would here record our best thanks to the Borough Council and to Mr. Henderson or the readiness with which they handed it over to us. Some stores and other articles which we did not think it necessary to bring from Melbourne having been procured, and Mr. Dalton, a resident of the Gap, with whom we had arranged for the carriage of all our paraphernalia, being in punctual attendance, his dray was carefully loaded; and a fairly good load it was. A star!

was made at a quarter to two. The day was fine and rather warm, and, the road being a good one, satisfactory progress was made. The country the whole distance to Hall's Gap was dry and very poor looking, and the timber for the first few miles mostly saplings of blue and white gum. At Mopilly, about half way, a refreshing drink of water was obtained, and from there the country is sandy, with stunted trees and low-growing shrubs, of which the prettiest is a Grevillea, *G. ilicifolia*. There were also *Calycothrix sullivani*, *Thryptomene mitchelliana*, as well as numerous fine specimens of the Grass Tree, *Xanthorrhœa australis*, and, close to the entrance to the Gap, *Acacia mitchelli*. Nearly the whole distance there was abundance of the little geranium, *Pelargonium australe*, with, of course, occasional other common flowers, including the small pink convolvulus, *C. erubescens*. Of birds, the most numerous were the honey-eaters, of which a large variety was seen, and there was also several kinds of parrots, including the Blue Mountain and Musk Parakeets, as also naturally a few magpies and crows. Not many Lepidoptera were observed, but we noted *Pyrameis kershawi*, *P. itea*, *Xenica klugii*, *X. kershawi*, and *Heteronympha merope*. Coleoptera were exceedingly scarce, there being but few of the shrubs on which they are usually found in flower; and as for logs, the ground was altogether too dry to expect to find anything under them, although, of course, they were tried. After passing Mopilly we get into rabbit country, plenty of these animals being seen, as also a kangaroo and a few wallaby. We reached the Gap at a quarter to nine, and the use of a comparatively new house belonging to the Dalton family having been granted to us, we at once proceeded to make ourselves comfortable, and, after an enjoyable tea, were not long before we rolled ourselves in our blankets and rugs and were sound asleep.

During the night it rained rather heavily, but Sunday morning, the 22nd, opened fine, and after breakfast we started for waterfall on Stony Creek, said to be about three miles distant. After going half a mile we come to a pretty pool called Venus's Bath. The party soon got separated, one portion continuing the route to the falls, whilst the other kept to an old jinker track leading in the same direction. Several shrubs were in flower, such as *Pomaderris subrepanda*, *P. apetala*, *Prostanthera lasiantha* and *P. rotundifolia*, and there was also an abundance of the everlasting flowers, *Helichrysum baxteri* and *H. blandowskianum*. Saw a few Lepidoptera, including *Epinephile abeona*, *Delias harpalace*, *H. merope* and *P. kershawi*. On the Leptospermum, of which there was a large quantity in flower, very little insect life was observable, the commonest being a Buprestis beetle, *Stigmodera* (sp.), and a Clerus, *Eleale pulchra*. A very pretty specimen of a dried wild bees' hive was secured, it being in appearance exactly like a pure

white shell. Of orchids scarcely one was seen, and it was evident that both for these and many of the prettier shrubs we were rather late in our visit. Stony Creek has in it Blackfish and Mountain Trout, but both are small, and neither in sufficient quantity to make it worth while to angle for them. The falls have a drop of about thirty feet. The Wallaby Rocks present a steep and difficult ascent, and are situate close to Venus's Bath, previously mentioned.

MONDAY, 23RD NOVEMBER.—Beautiful morning, with promise of great heat. Several members who were up early to try for a shot at kangaroo or wallaby were evidently not successful; at all events they returned empty-handed, although one did report that a wallaby had succumbed to his prowess, but as it was not forthcoming considerable doubt was expressed on the subject. Here it will perhaps be as well to state that the past winter has been the driest known in the Gap for years, many small streams being, for the first time in the experience of the oldest inhabitant, quite dry. Ascended one of the highest parts of the Serra Range. The ascent, as is indeed the case with all the Grampians, is by no means pleasant, consisting of continual clambering over boulders, varied by occasional slippings, and some of the party were not at all sorry when the summit was reached. To attempt in such a rough locality to collect anything but plants was almost an impossibility, consequently so far as entomology is concerned there is little to record, except that a few Lepidoptera of the species previously mentioned and an Agarista were observed. The *Leptospermum myrtifolium* was in splendid flower, but scarcely a living thing was on it. Either owing to the dry winter or that the spring had been a cold one, and that, therefore, most of the insects had not yet emerged from the pupa state, the fact remains that during the whole fortnight trip insects were exceedingly scarce. A few Black Cockatoos (*Callocephalon galeatum*), were seen, as also a Black-cheeked Falcon (*Falco melanogenys*). On this day's trip we for the first time observed the little *Candollea sobolifera*, which was very conspicuous, and we also came across *Eucalyptus alpina*, the latter at a height of not more than about 1,500 feet. It was noticeable as a peculiarity that whilst the east side of the Serra Range, was almost perpendicular, the west had a long slope working gradually down to the valley. After descending, and whilst resting on Stony Creek, a bird concert was heard from the opposite side, and presently a whole flock of New Holland Honey-eaters rose from a thick bush, on searching which the nest and two eggs were seen and secured. We also took nest with several eggs of *Acanthiza nana* (?) This latter nest was built in a very prickly acacia (*A. armata*), and was only secured after the member who had the job in hand had run several of the sharp prickly spines into his hands and fingers. Along the creek were

some fine specimens of the beautiful fern *Osmunda* (late *Todea*) *barbara*, also of *Gleichenia circinata*, *G. flabellata*, and *G. dicarpa*. Lizards, principally *Hinulia whiteii* and *H. quoyii* were plentiful, but not so snakes, as only two were seen, one being a Copper-head (*Hoplocephalus superbus*) and the other a brown (*Diemenia superciliosa*). Of other lizards, *Liolepisma guichenoti* was plentiful, being the most common one seen on the lower ground during the whole trip, whilst *H. whiteii* was most numerous on the hills, and we also secured specimens of the more rare *Tropidolepis albonotata*. The birds shot included the Striated Pardalote (*P. ornatus*), and Lunulated Honey-eater (*Melithreptus lunulatus*). On our return to camp we found one of the Daltons had killed a fine Black Snake (*Pseudechys porphyriacus*) nearly four feet long, which was duly bottled; and in the evening a large Podargus (*P. strigoides*) was shot and carefully skinned.

TUESDAY, 24TH NOVEMBER.—Exceedingly warm. Arranged to go to Turret Falls, some five or six miles up Stony Creek, with two of the Daltons as guides. On the road again tried *Leptospermum* for insects, and met with slightly better success, the best captures being two Longicorn beetles—one being a rare specimen of *Pseudocephalus*, and the other *Trichomesia newmani*. The plants noted for the first time since our arrival were *Styphelia sonderi*, *Dodonaea viscosa*, *Scævola æmula*, *Veronica derwentia*, *Lhotzkya genetilloides*, *Sphaerolobium vimineum*, *Drosera binata*, *Acacia retinoides*, and *Boronia polygalifolia*. After lunching at the Falls, which have a drop of some fifty feet, some of the party, in company with the elder Dalton, struck off for Mt. Difficult, from whence they returned, after a hard climb, at about 7 o'clock. On the summit they had a good view of the surrounding country, including the Wartook Reservoir, Mt. Arapiles, Natimuk, &c. Near the summit one of our party succeeded in bringing down a fine specimen of the Black Cockatoo. Of plants in flower near the top were specially noted *Coprosma hirtella*, *Styphelia pinnata*, and *Brachyloma daphnoides*.

Our attention was drawn to the fact of nearly all the wattles (*Acacia decurrens*) in the Gap presenting a dying appearance, this being the work of the larvæ of a small greenish-coloured Chrysomela beetle of the genus *Paropsis*. None of the larvæ were now observable, so it is to be presumed the trees will soon begin to show signs of fresh foliage. In connection with wattles, we may mention that up the range to the summit nearly all had been stripped for their bark, and we were informed that the strippers' method of collecting was not to carry the bark but to tie it in bundles and roll them down, with the result that they frequently found their way into the numerous gullies and there remained undiscovered.

Every evening the camp has been swarming with the common

large dark-brown moth, well known to almost every householder, and familiarly known as the Old Lady, its scientific name being *Dasypodia*. Thinking other species of Lepidoptera might be secured we hung up outside a large sheet taken with us for this purpose, and a brilliant lamp, but not a single thing was attracted by it—probably the evening was too cold—and after patiently watching for two hours the experiment was given up; sugaring was also tried, with a like unsatisfactory result.

WEDNESDAY, 25TH NOVEMBER.—Extremely hot, hence it was perhaps fortunate we had decided to devote this day to partly collecting in vicinity of camp and partly to packing ready for removal to higher up the Gap. In the early morning a party was out with guns, but had very little sport, the best thing secured being a pair of Bronze Cuckoos (*Chalcites plagosus*). They saw a few kangaroos, but they were too distant to offer any chance of shooting with effect. In the swamp near camp a specimen of the pretty little Emu Wren (*Stipiturus malachurus*) was shot, as was also one of the Spotted Pardalotes. Again tried *Leptospermum* on creek for insects, but found it not any better than on previous occasions, the only beetle worth noting being a Longicorn, *Distichocera* (var.). Started a Bronzewing Pigeon (*Phaps chalcoptera*), also a rabbit, of which latter animal several were seen about the camp, but they do not appear to be very plentiful. Whilst working round the swamp a little excitement occurred on the capture of a Ring-tailed Opossum, which we were informed had its nest in a sapling. The nest being found, the delicate question arose as to how best to secure the animal, which was settled by its making tracks to the adjacent sapling, from which it was quickly dislodged, only to make to the next, and so on for several, with all the party scrambling after it as rapidly as possible, until in one final rush, all tumbling over one another, the game was bagged, and eventually brought safely to Melbourne. Under the bark of some red gum trees a few specimens of the following beetles were taken, viz.:—*Coptocercus rubripes*, *Epithora dorsalis*, *Phoracantha recurva*, *Pylus satuus*, *Hapatesus hirtus*, the last being very plentiful, as were also several of the common Elaters. Although not hitherto mentioned, spiders had not been neglected, as the member who had charge of this branch secured during the trip fully 70 species, representing 25 genera, including *Epeira*, *Tetragnatha*, *Ariamnes*, *Theridium*, *Mygale*, &c.

THURSDAY, 26TH NOVEMBER.—Had breakfast at 7.30 which included some Blackfish and Trout caught the previous evening in Fyans Creek. Fred was up very early to try his hand with the gun, but met with no sport; indeed, it seemed as if the longer we stayed the scarcer it became—not, certainly, from our destructiveness. All he saw was one rabbit, and not a sign of kangaroo or wallaby. Started for second camp, the Borough Hut, previously

alluded to, about eight miles distant. At schoolhouse, about half way, we took photograph of the children, some 15. This schoolhouse is of very modest pretensions, consisting merely of a room in the house of Mr. W. Dalton, who kindly lends it for the purpose. On arrival at camp Mr. M'Donnell, the caretaker, was absent, but on presenting to his wife the letter given to us by Mr. Henderson, the superintendent, we were at once given the key. This hut, or, more properly speaking, cottage, contains two rooms, in one of which are four bedsteads, with mattresses and palliasses sufficient for double that number, so that we had no difficulty in making ourselves comfortable. In order that we might have plenty of room, one of our tents was erected, in which we kept our stores, whilst the second room of the hut was devoted to dining and general purposes during the day and a bedroom at night. Having put things in order and had tea, we went to Mr. C. Dalton's, about half a mile distant, and were shown his collection of plants. Mr. Dalton has an intimate knowledge of the Grampians botany—a knowledge which proved very useful to us, especially as he was only too willing to give us all the information and assistance in his power. One of his sisters is an excellent painter of the native flowers, and several of her works have been seen at our and other exhibitions, and she is well known to several Melbourne lithographers and engravers, for whom, we believe, she does occasional work. Should any of our members contemplate a visit to the Grampians, they cannot do better than engage with Mr. C. Dalton, whose family will make them as comfortable as they could wish, as well as show them all round the country.

FRIDAY, 27TH NOVEMBER.—As arranged the previous evening, young Galley Dalton arrived about 8, ready to accompany us to the Victoria Valley. His uncle, C. Dalton, was to be our guide, and having called for him, we at once made a start. The morning was cloudy and chilly, just suitable for travelling, and although a little rain fell it was not heavy enough to give any inconvenience. Our route was to be over Middleton's Gap, a course which took us nearly due west from our camp. The ascent for the first half was easy, but the second was rather difficult, owing to the loose stones, which caused considerable slipping. After resting a while at head of the gap we commenced the descent on opposite side, doing a good deal of collecting on the way, especially in the botanical section, and in this we met with a very fair measure of success. Especially plentiful was the pretty blue lily, *Calectasia cyanea*, as also *Boronia pilosa*, *Helichrysum blandowskianum*, and *Melaleuca decussata*. Other plants worthy of note were *Brachyloma daphnoides*, *Styphelia thymifolia*, *Bossiaea cinerea*, *Epacris impressa*, *Sprengelia incarnata*, and *Marianthus bignoniaceus*. The *Leptospermum myrtifolium* was here in truly splendid flower, and it

was a great disappointment to find that it had practically no life whatever on it, if we except three specimens of the common Buprestis beetle, *Stigmodera macularia*. As we rapidly descended signs of emu were very plentiful, this evidently being a favourite feeding ground for them, in consequence, no doubt, of the abundance of the shrub *Styphelia sonderi*, of the fruit of which they are very fond. On reaching the valley we had lunch at the creek, and after some discussion, three members, with Mr. C. Dalton, decided to go on to the forester's hut with the letter given to us by Mr. Perrin, whilst the rest, there being no provisions whatever with the party, and feeling it would be taxing the forester's hospitality too much to expect him to accommodate the whole, elected to return to camp. Accordingly we separated, and the returning portion continued collecting, meeting with fair success. Several lizards were taken, including the pretty and amusing little Gecko, *Diplodactylus marmoratus*; also, *Rhodona bougainvillei*, as well as some fine scorpions. On the moist patches on the rocks there was plenty of moss and growing on this were hundreds of the flowers of the Utricularia. Only two snakes were seen, and both unfortunately escaped, owing to the difficulty in capturing such slippery and quick-moving reptiles amongst stones, in which there is so much shelter for them. Around the camp there were plenty of parrots, of which several were shot, as also a Cormorant, a pair of which had recently come to the neighbourhood; one had already been shot, and now its partner had met a similar fate. At the head of Middleton's Gap, there is a fine view of the country for miles around, as also of the neighbouring rocks, one being very conspicuous, standing high up by itself, right in front of the Gap, and is known as the Castle Rock, a singularly appropriate name; indeed, by one of our party it was not inaptly named Edinburgh Castle. Several Black Cockatoos were seen, and a beautiful nest, with eggs, of the Harmonious Thrush (*Collyriocincla harmonica*) was taken.

SATURDAY, 28TH NOVEMBER.—Beautiful morning, slightly cloudy, with nice cool breeze. About 200 yards from camp there is a clear mountain stream, and this was largely availed of for drinking and cooking purposes, as also for morning and evening baths. After breakfast, started east for Barney's Castle, a fine high rock, distant about three miles, and so named after a departed old identity, who, report says, had his camp in the vicinity. Track was very good, having been made for drays when sawmills were working; they are now all closed, and it will not be long before it will be again grown over. Whilst proceeding on track we started a large Eaglehawk, and on reaching the spot from which he had risen we saw remains of a large Rugged Stump-tailed Lizard (*Trachydosaurus rugosus*), on examining which we were surprised to find that, contrary to the lizard's

usual habit, he was a vegetable feeder, his stomach being filled with *Styphelia* berries and fungus. Of this same species of lizard we took a live specimen, also one of *Cyclodus nigro-lutea*, this latter being rather numerous. This was the first day on which we met with any success in orchids, as we took specimens of *Thelymitra fusco-lutea* and *Calochilus robertsoni*. Several kangaroos and wallabies were seen, also traces of emu. Took a few Lepidoptera, including two Skippers, and from off a few scattered plants of *Leptospermum* several specimens of the Longicorn beetle *Trichomesia newmani*; also a few Buprestis, including *Stigmadera octospilota*. In the evening the Victoria Valley party returned, bringing with them a Black Duck, which, in company with several parrots and a plentiful supply of rice and onions, was cooked next day, and made a very acceptable addition and change to our usual *menu* of tinned provisions. They reported having arrived at the forester's hut—a photograph of which was taken—about 5 o'clock; but there being no one at home they entered through the window, and finding flour, sugar, and some fat, they made themselves at home, afterwards availing themselves of the forester's blankets to sleep in. They left Mr. Perrin's note and an apology for the liberty they had taken with his household goods, and also invited him to visit our camp, when due restitution would be made for our peculations. Whether the forester—Mr. Elliott—did not return in time to pay us a visit we cannot say; at all events, we saw nothing of him, and we can, therefore, only take this additional opportunity of thanking him for his involuntary hospitality. The party also reported that the valley consisted of scrub and swamps, with occasional patches of grass land and belts of timber, of which a good deal is red gum—now carefully preserved—and wattles. Game—comprising kangaroo, wallaby, and emus—was in great abundance, as also Black Swans, ducks, &c., but the latter were exceedingly difficult to get near. They shot one of the brilliant-coloured Australian Bee-eater, *Merops ornatus*, and saw large numbers of the smaller variety of birds.

SUNDAY, 29TH NOVEMBER.—Weather fine. During a morning's walk a fine large orange and brown moth (*Gastrophora henricaria*) was taken. In the afternoon, went up the course of flume of Stawell water supply for about three miles, and found specimens of a couple of orchids (*Caleya major* and *Caladenia patersonii*). One of our party, whose lynx eye has to be credited for many of the orchids we had so far taken, added still further to his reputation by discovering, growing in the moist earth on the moss-covered stones close by the flume, several of the small and rare *Caleya minor*. Saw several kangaroo and a few emus.

MONDAY, 30TH NOVEMBER.—Morning very warm. Started with intention of ascending Mt. William, but after passing the sites of

three disused sawmills, the last being distant from camp about five miles, the track was lost, so made for the Bovine Falls, which we reached about 2 o'clock, and it being now too late to think of carrying out our original design, we had lunch, and took several views of the falls. These falls have a drop of 50 or 60 feet, and when there is a good volume of water they would, no doubt, present a grand appearance, but at time of our visit the creek had almost ceased running. Owing to the lateness of the hour at which we started on our return, not much collecting was done, but our botanists brought a few of the representative plants, they being mostly the same as seen on previous days.

TUESDAY, 1ST DECEMBER.—Weather very hot. Decided to collect round camp, each member to do as he pleased, instead of any concerted action, as hitherto. The record of work done is not a very extensive one, but it includes the killing of a Copper-headed Snake (*Hoplocephalus superbus*), the first one we had so far killed about the camp. From off the bushes some rare spiders were taken, but, as with all insects, the logs when turned over yielded scarcely any sport. In plants we may mention *Pimelia flava* and *Prostanthera hirtella* as being seen in flower. In our search for Planarians, although not very successful, we were fortunate enough to secure a few of four different species. Mr. C. Dalton having issued a special invitation for us to visit him, a deal of the afternoon was devoted to getting ready our best clothes, in anticipation of meeting several young lady visitors, but in this anticipation we were doomed to disappointment. We, however, spent a very pleasant and entertaining evening, as we not only had a much closer examination of Mr. Dalton's extensive collection of Grampian and Mallee plants, but were also shown several more of his sister's paintings of flowers, and, in addition, we had a look through Mr. Dalton's album of autograph letters from some of England's most celebrated men, including the Duke of Wellington, Dan O'Connell, &c. The exhibit that interested us as much as anything was a real curiosity in the shape of an original threatening letter from the Irish moonlighters to one of Mr. Dalton's relations, ordering him to get his coffin ready, as his fate was sealed.

Round Mr. Dalton's house there is a nice running creek, over which there are several rustic bridges, one being known as Barney's Bridge, a pretty view of which was taken, having on it the four young lady visitors whom we had been expecting to meet in the evening.

WEDNESDAY, 2ND DECEMBER.—Morning fine, with prospect of being very hot. In accordance with arrangements made the previous evening some of the party started, in company with Messrs. C. and G. Dalton, to ascend Mt. William, whilst the others, in company with the Misses Dalton, visited the Silver

Band Falls, which are situated about a mile at rear of the school-house. These falls, as indeed was the case with all the Grampian falls we visited, had very little water running over them, hence their beauty was not very apparent; but we can well imagine they would deserve their name when at their best, as there is a pretty fall of about 70 or 80 feet, and in appearance the falling water exactly resembles a shining band. There being a deal of red gum about here, we expected to get a good variety of beetles under the bark, but we met with so little success that we were compelled to abandon the search. At the falls there used to be several of the tree fern, *Dicksonia antarctica*, but the visiting Goths had destroyed or carried away all excepting one, which stood alone in its glory, and which it is to be hoped will be long allowed to do so. We here amongst the ferns secured one of the interesting and beautifully-constructed nests of one of the Acanthizas, but, unfortunately, it had no eggs in it.

The Mt. William party returned about 8 o'clock, and reported the height to be, as proved by two aneroids, 3,700 feet, this being considerably less than what local report gives it credit for. Having had to push on to reach the summit they had not attempted to do much collecting, but they were fortunate enough to obtain specimens of the following plants:—*Lasiopetalum dasypyllum*, *Pultenaea rosea*, *P. juniperina*, *Grevillea pinnata*, *G. confertifolia*, *Styphelia lanceolata*, *Lobelia rhombifolia*, *Baeckea diffusa*, *Pseudanthus ovalifolius*, *Aster asterotrichus*, and *Comesperma calymega*. They also came across some fine *Leptospermum* in flower, which they tried for insects, but were not very successful, the high wind that was now blowing greatly retarding their efforts to effect captures. As it was also threatening rain, they hastened on to their destination, so as, if possible, to have sufficient daylight for their return, the track being by no means a pleasant one for travelling along in the dark. In addition to what has already been mentioned, they had the good luck to capture one of the little White-lipped Snakes, *Hoplocephalus flagellum*.

THURSDAY, 3RD DECEMBER.—Two of our party, who had to be in Melbourne by Friday morning, took their departure soon after breakfast, being shown a short track across the range by Mr. M'Donnell, and they reached Stawell in ample time to catch the afternoon train. Broke up camp, and left for No. 1 about 10 o'clock. The M'Donnells had been very kind to us, having granted us the use of many articles, not the least of which was a camp oven, by which we were enabled, with our cook's assistance, to make splendid bread. Mr. M'Donnell also, as he was one day going into Stawell, took our letters, thus enabling us to let our friends and the hon. secretary know how we were doing.

We made a parting call at Mr. C. Dalton's, who, however, was not at home, being away with two of his sisters at another of his places, known as the Hermitage, some two miles lower down. We called there on our way, and, after he had once more extended to us his hospitality, we left him with regret. Of him and his sisters and two nephews we cannot speak too highly, and we have no hesitation in saying that to them we are indebted for seeing as much as we did, and most certainly without Mr. C. Dalton as guide we should not have been able to find our way to the Victoria Valley.

One more parting visit we had to pay, and that was to Mr. W. Dalton—a brother of Mr. C. Dalton—at the schoolhouse. After amusing the school children with races, time began to press, and we had reluctantly to leave, they wishing us good-bye with hearty cheers, to which we of course responded. We had not gone above half-a-mile when we heard a "coo-ee," and looking back to see from whom it emanated, saw a lad hurrying up, and when he reached us we found he had brought a nice present in the shape of some eggs, thoughtfully sent by Mrs. W. Dalton. Those only who, like ourselves, have been living on tinned provisions for some time, in a locality where practically nothing was obtainable, can appreciate the thoughtfulness of such an acquisition to our almost exhausted stores, or the consequent pleasure with which it was received. Whilst on road again, tried under bark of trees for insects, and met with much more success. Beetles being far more plentiful, and although no rare ones were obtained, it helped to confirm our previous impression that, this year at all events, we were rather too early, as they were evidently becoming daily more plentiful. Saw a Spotted Pardalote enter its nest in ground at roadside, and having carefully dug around had hoped to secure the bird as well as its nest and eggs, but it escaped; and as the nest, on being reached proved to have two young ones in it, and had been broken to pieces in extracting it, we had to destroy the young birds, as otherwise they would have fallen a prey to the ants. The Leptospermum on creek still had but little life on it; indeed, if anything, it had less than when we first tried it, so finally gave up searching it as a bad job. Some fine hornets were seen on the track above the creek, and a pair of these were secured.

FRIDAY, 4TH DECEMBER.—Morning warm, with every prospect of day being very hot. Packed up everything and loaded dray, and made a start on our return at about 11 o'clock. At the entrance to Gap, a search of an hour was made for a large snake said to have its abode there, but no sign of it was seen. Like all country reports of snakes, its length was no doubt exaggerated, as we find it difficult to believe it could be from 8 to 10 feet, which was the size it locally obtained credit for. For several

years it had been reported as being seen occasionally, but no one had apparently, so far, had the courage to attempt its destruction, or still less its capture. So soon as we emerged from the Gap, and were well on the track, there were plentiful signs of snakes and lizards, but not one of either of these reptiles was seen. Lepidoptera were more numerous than at any time during our trip, hundreds of *H. merope*, *P. kershawi*, and *X. klugii*, and two species of Skippers—genus *Hesperilla*—being seen; but as we were travelling rather quickly, we could not devote much time to securing specimens. Rested and lunched at Mopilly, to whose host we were indebted for a liberal supply of that very necessary liquid, pure water; and then on to Stawell, which we reached about 6 o'clock. After a refreshing bath we had a hearty dinner, of which not the least enjoyable portion was the potatoes, which we had not tasted for a fortnight. When bed-time arrived, we were not long before we were sound asleep, for which we were prepared by our long, dusty walk of some 18 or 20 miles.

Saturday morning, 5th December, we saw the last of Stawell; but before leaving we called at the Town Hall and thanked the Town Clerk and Mr. Henderson, on behalf of the Club, for having granted the use of the Borough Hut. The train left shortly after 11, and we reached Melbourne about half-past 8.

Summed up, we may say that if our excursion, from a collector's point of view, was not an unqualified success, it was certainly a most pleasurable one. Fine weather was experienced during the whole time, and it was not the fault of the members of the party that better results were not obtained. We are inclined to think that to the dry winter just passed, and the late spring, is to be attributed the scarcity of specimens. This remark does not so much apply to botany as to other branches of natural history, for the botanists were far and away the most successful, as well as certainly the most indefatigable, and as a result a really good collection of plants of the district was obtained. In bird life there was little observable that is not so elsewhere nearer Melbourne; neither was there any great variety of snakes or lizards, and to the collectors of these, as also to the entomologist, the excursion was especially disappointing. From the well-known extensive variety of flowering shrubs in the Grampians, coupled with the fact that several are peculiar to the district, it was fully expected that we would secure at least a few clearly representative Lepidoptera or Coleoptera, but not a specimen of either family was seen that is not common in and around Melbourne. Whether another year at same season might prove more productive is matter of speculation. Some of us favour the belief that it would, and we therefore hope our experience will not deter other members from arranging a second trip, when

we trust they will be able to give a much better report of their doings than we have unfortunately been able to do.

The following is a complete list of the specimens collected, and we would here thank our photographic members, especially Mr. Searle, for the trouble they have taken in preparing the lantern slides to illustrate the excursion.

## BIRDS.

<i>Aquila audax</i>	Wedge-tailed Eagle
<i>Haliastur sphenurus</i>	Whistling Eagle
<i>Falco melanogenys</i>	Black-cheeked Falcon
<i>Falco subniger</i>	Black Falcon
<i>Hieracidea orientalis</i>	Western Brown Hawk
<i>Hieracidea berigora</i>	Brown Hawk
<i>Tinnunculus cenchroides</i>	Nankeen Kestrel
<i>Astur approximans</i>	Australian Goshawk
<i>Ninox strenua</i>	Powerful Owl
<i>Ninox boobook</i>	Boobook Owl
<i>Podargus strigoides</i>	Tawny-shouldered Podargus
* <i>Hirundo frontalis</i>	Welcome Swallow
<i>Merops ornatus</i>	Australian Bee-eater
<i>Dacelo gigas</i>	Laughing Jackass
<i>Halcyon sanctus</i>	Sacred Kingfisher
<i>Alcyone azurea</i>	Azure Kingfisher
<i>Artamus sordidus</i>	Wood Swallow [low]
<i>Artamus superciliosus</i>	White-eyebrowed Wood Swallow
<i>Pardalotus punctatus</i>	Spotted Pardalote
<i>Pardalotus ornatus</i>	Striated Pardalote
<i>Strepera graculina</i>	Pied Crow Shrike
<i>Gymnorhina tibicen</i>	Piping Crow Shrike
<i>Grallina picata</i>	Magpie Lark
<i>Grauculus melanops</i>	Black-faced Grauculus
<i>Pachycephala gutturalis</i>	White-throated Thickhead
<i>Pachycephala rufiventris</i>	Rufous-breasted Thickhead
* <i>Collyriocincia harmonica</i>	Harmonious Shrike Thrush
<i>Falcunculus frontatus</i>	Frontal Shrike Tit
<i>Rhipidura albiscapa</i>	White-shafted Fantail
<i>Sauloprocta motacilloides</i>	Black Fantail
<i>Myiagra nitida</i>	Shining Flycatcher
<i>Petræca leggii</i>	Scarlet-breasted Robin
<i>Petræca phoenicea</i>	Flame-breasted Robin
<i>Melanodryas bicolor</i>	Pied Robin
<i>Eopsaltria australis</i>	Yellow-breasted Robin
<i>Malurus cyaneus</i>	Superb Warbler
<i>Amytis textilis</i>	Textile Wren
<i>Stipiturus malachurus</i>	Emu Wren
<i>Cisticola exilis</i>	Exile Grass Warbler
<i>Sericornis humilis</i>	Sombre Sericornis

Acanthiza pusilla	Little Brown Acanthiza
Geobasileus chrysorrhœa	Yellow-rumped Geobasileus
Epthianura albifrons	White-fronted Epthianura
Anthus australis	Australian Pipit
Sphenoeacus gramineus	Little Grass Bird
Calamoherpe australis	Reed Warbler
Estrilda temporalis	Red-eyebrowed Finch
Estrilda guttata	Spotted-sided Finch
Corvus coronoides	White-eyed Crow
Pomastostomus temporalis	Temporal Pomastostomus
Meliornis novæ-hollandiæ	New Holland Honey-eater
Ptilotis leucotis	White-eared Honey-eater
Ptilotis auricomis	Yellow-tufted Honey-eater
Ptilotis cratitia	Wattle-cheeked Honey-eater
Ptilotis penicillata	White-plumed Honey-eater
Ptilotis chrysops	Yellow-faced Honey-eater
Acanthochæra carunculata	Wattle Bird
Acanthorhynchus tenuirostris	Spine-billed Honey-eater
Philemon corniculatus	Leatherhead
Melithreptus lunulatus	Lunulated Honey-eater
Myzantha garrula	Garrulous Honey-eater
Dicæum hirundinaceum	Swallow Dicæum
Zosterops cærulescens	Grey-backed Zosterops
Climacteris scandens	Brown Tree Creeper
Cacomantis pallida	Pallid Cuckoo
Cacomantis flabelliformis	Fan-tailed Cuckoo
Chalcites plagosus	Bronze Cuckoo
Cacatua galerita	Sulphur-crested Cockatoo
Calyptorhynchus funereus	Funereal Black Cockatoo
Callocephalon galeatum	Gang Gang Cockatoo
Platycercus pennantii	Pennant's Parrakeet
Platycercus eximius	Rosella Parrakeet
*Calopsittacus novæ-hollandiæ	Cockatoo Parrakeet
Trichoglossus novæ-hollandiæ	Blue Mountain Parrakeet
Trichoglossus concinnus	Musk Parrakeet
Trichoglossus pusillus	Little Parrakeet
Phaps chalcoptera	Bronzewing Pigeon
Geopelia tranquilla	Peaceful Dove
Coturnix pectoralis	Pectoral Quail
Dromaius novæ-hollandiæ	Emu
Threskiornis stictipennis	White Ibis
Ardea novæ-hollandiæ	White-fronted Heron
Hypotænidia philippensis	Pectoral Rail
Cygnus atratus	Black Swan
Branta jubata	Maned Goose
Casarca tadornoides	Chestnut-coloured Shieldrake
Anas superciliosa	Australian Wild Duck
Graculus novæ-hollandiæ	Australian Cormorant

## REPTILES..

## Lacertilia.

Fam. Geckonidæ—*Diplodactylus marmoratus*.  
 Fam. Scincidæ—*Tropidolepisma albonatata*, M'Coy  
     *Trachydosaurus rugosus*, Gray  
     *Cyclodus nigro-lutea*, Gray  
     *Hinulia whitei*, Lacep.  
     ,, *quoyi*, D. and B.  
     *Liolepisma trilineatum*, Gray.  
     ,, *guichenoti*, D. and B.  
     *Rhodona bougainvillei*, Gray.

## Ophidia.

## Colubridæ.

Fam. Elapidæ—*Diemenia superciliosa*, Fischer  
     *Hoplocephalus curtus*, Schleg.  
     ,, *superbus*, Günth.  
     ,, *coronooides*, Günth.  
     *Pseudechys porphyriacus*, Shaw.

## PLANTS.

Viola hederacea, Labillardière	Sphærolobium vimineum, Smith
Marianthus bignoniaceus, F. v. M.	„ davisoides, Turczaninow
Drosera binata, Labillardière	Viminaria denudata, Smith
Comesperma calymega, Lab.	Daviesia brevifolia, Lindley
Boronia pinnata, Smith	Pultenæa rosea, F. v. M.
„ pilosa, Labillardière	„ juniperina, Labillardière
„ polygalifolia, Smith (var. trifoliata)	„ sp.
Eriostemon pungens, Lindley	„ sp.
„ Hillebrandi, F. v. M.	Dillwynia ericifolia, Smith
„ pleurandroides, F. v. M.	„ floribunda, Smith
Correa æmula, F. v. M.	„ sp.
„ speciosa, Andrews	Platylobium obtusangulum, Hooker
„ lawrenciana, Hooker	Bossiaeæ cinerea, R. Brown (var. rosmarinifolia)
Lasiopetalum dasyphyllum, Sieber	Glycine tabercina, Labillardière
Casuarina distyla, Ventenat	Acacia retinodes, Schlechtendal
Dodonæa viscosa, Linné	„ pycnantha, Bentham
Stackhousia linearifolia, Cun. viminea, Smith	„ myrtifolia, Willdenow
Stellaria pungens, Brognart	„ oxycedrus, Sieber
Gompholobium huegelii, Ben.	„ mitchelli, Bentham
	„ sp.
	Bauera sessiliflora, F. v. M.
	Calycothrix tetragona, Lab.

Lhotzkya genetylloides, F. v. M.  
*Thryptomene mitchelliana*, F. v. M.  
 " *ciliata*, F. v. M.  
*Baeckea diffusa*, Sieber  
*Leptospermum lanigerum*, Smith  
 " *flavescens*, Smith  
 (var. *grandiflorum*)  
*Kunzea parviflora*, Schauer  
*Melaleuca ericifolia*, Smith  
 " *gibbosa*, Labillardière  
 " *decussata*, R. Brown  
 " *squarrosa*, Smith  
 " *squamaea*, Labillardière  
*Eucalyptus alpina*, Lindley  
*Pomaderris elachophylla*, F. v. M.  
*Cryptandra daltoni*, F. v. M.  
 " *hookeri*, F. v. M.  
*Astrotricha ledifolia*, De Candolle  
*Trachymene billardieri*, F. v. M.  
*Conospermum mitchelli*, Meiss.  
 " *patens*, Schlechtendal  
*Grevillea confertifolia*, F. v. M.  
 " *alpina*, Lindley (var. *biflora*)  
 " sp.  
*Hakea pugioniformis*, Cavanilles  
 " sp.  
*Pimelea flava*, R. Brown  
 " *octophylla*, R. Brown  
*Coprosma hirtella*, Labillardière  
*Aster asterotrichus*, F. v. M.  
 " *myrsinoides*, Labillardière  
 " *ramulosus*, Lab. (var. *acutifolia*)  
*Helichrysum baxteri*, Cun.  
 " *lucidum*, Henckel  
 " *blandowskianum*, Steetz  
 " *obcordatum*, F. v. M.  
*Humea elegans*, Smith

*Senecio dryadeus*, Sieber (var. *hypoglaaca*)  
*Lobelia rhombifolia*, De Vries  
*Candollea serrulata*, Lab.  
 " *sobolifera*, F. v. M.  
*Scævola æmula*, R. Brown  
*Goodenia geniculata*, R. Brown  
 " *humilis*, R. Brown  
*Mitrásacme pilosa*, Lab.  
*Mazus pumilio*, R. Brown  
*Veronica derwentia*, Littlejohn  
*Euphrasia brownii*, F. v. M.  
*Utricularia dichotoma*, Labillardière (var. *singuliflora*)  
*Prostanthera lasiantha*, Lab.  
 " *hirtula*, F. v. M.  
 " *debilis*, F. v. M.  
*Styphelia sonderi*, F. v. M.  
 " *pinifolia*, F. v. M.  
 " *australis*, F. v. M.  
 " *thymifolia*, F. v. M.  
 " *glacialis*, F. v. M.  
 " *virgata*, Labillardière  
 " *rufa*, F. v. M.  
*Brachyloma daphnoides*, Benth.  
 " *depressum*, Benth.  
*Epacris impressa*, Labillardière  
*Sprengelia incarnata*, Smith  
*Gastrodia sesamoides*, R. Brown  
*Diuris sulphurea*, R. Brown  
*Thelymitra ixioides*, Swartz  
 " *fusco-lutea*, R. Brown  
*Calochilus robertsoni*, Bentham  
*Caleya major*, R. Brown  
 " *minor*, R. Brown  
*Caladenia patersonii*, R. Brown  
 " *carnea*, R. Brown (var.)  
*Patersonia longiscapa*, Sweet  
*Dianella longifolia*, R. Brown  
*Bartlingia sessiliflora*, F. v. M.  
*Calectasia cyanea*, R. Brown  
*Lepyrodia muelleri*, Bentham  
*Restio tetraphyllus*, Labillardière  
*Gleichenia circinata*, Swartz

DESCRIPTIONS OF NEW AUSTRALIAN PLANTS, WITH  
OCCASIONAL OTHER ANNOTATIONS;

BY BARON VON MUELLER, K.C.M.G., M. & PH.D., F.R.S.

(Continued.)

EUGENIA MINUTULIFLORA.

Glabrous ; branchlets almost cylindric ; leaves rather light green, obovate or elliptic-cuneate, gradually narrowed into a short petiole, without lustre on either page, slightly paler beneath, their venulation pinnular, subtle, immersed, their punctuation seldom anywhere transparent ; panicles rather small, but trichotomously brachiate ; flowers extremely small ; calyces attenuated into very short, often ternate pedicels, smooth, the lobes of each minute ; petals about half exserted, long continuing connivent or calyptrate ; stamens extremely short, never very numerous, their anthers ovate-roundish, opening by longitudinal slits ; style hardly emerging ; fruit rather large, depressed-globular, its pericarp somewhat succulent, whitish outside.

Near Port Darwin ; M. Holtze.

This species stands systematically very near *E. Smithii* in floral and carpic characteristics, but the leaves are of quite different shape and not shining nor dark-green above, while none of the anthers are biglobular, and all open with lateral dehiscence. *E. Armstrongi*, of which I have seen no authentic specimen, and of which the fruits remain unknown, cannot be our present plant, as Bentham kept it out of the section Syzygium, and indicates the petals and stamens as of greater length. *Eugenia Holtzei*, from material recently received, shows the following principal carpic qualities :—Ripe fruit urceolate-globular,  $\frac{1}{4}$ -inch to  $\frac{1}{3}$ -inch long, dark purplish outside, truncate at the summit, one-seeded.

EUGENIA APODOPHYLLA.

Glabrous ; branchlets prominently quadrangular ; leaves rather small, firmly chartaceous, long-acuminate, with rounded base sessile, pinnately thin-venulated, their punctuation much concealed ; flowers small, from two to four together between terminal leaves ; peduncles none ; calyx passing gradually into the twice longer pedicel, almost truncate, punctular-scabrous ; petals at first coalescent into an hemispheric lid, but some finally expanding ; stamens much longer than the petals ; anthers roundish when open ; style elongated ; ovulary sunk deeply ; fruit reddish.

On high summits of the Bellenden-Ker's Ranges ; W. Sayer.

Tree to 40 feet high, so far as known. Branchlets sometimes upwards quite membranously margined. Leaves 1 inch to  $2\frac{1}{2}$  inches long. United pedicels and flower-buds club-shaped. Petals measuring hardly  $\frac{1}{8}$  inch. Longest stamens fully  $\frac{1}{3}$  inch.

Ovulary two-celled, with rather numerous ovules. Fruit not available in a ripe state.

In form of flowers this plant comes very near *E. lanceolata*, but not in their disposition, while the absence of petioles and the shape of the leaves give our species already a totally different outer appearance.

The richness of the Bellenden-Ker's Ranges in peculiar plants was foreseen by myself in 1855, on account of their isolated high elevations; and the correctness of this anticipation was demonstrated by Mr. Sayer's mission, which—may it be said in justice to him—drew first scientific attention to the exuberance in the vegetable endemism there. But R. Brown must have had already a presentiment of those plants-riches, when he induced, in 1802, Captain Flinders to bestow on yonder mountains the name of the subsequent elucidator of so many Irideæ.

#### EUGENIA HEDRAIOPHYLLA.

Glabrous; branchlets very prominently quadrangular; leaves rather large, chartaceous, elliptic-lanceolar, gradually acuminate, with rounded base almost sessile, their venulation faint, pinnate and immersed, their punctuation copious but very subtle; flowers small, in ample brachiate panicles; peduncles from decurrent prominences very quadrangular; flowers frequently ternate on the ultimate peduncles; pedicels extremely short or obliterated; calyx hemispheric-turbinate, slightly lobed or almost truncate; petals hardly expanding; anthers very minute, about as long as broad; style capillary thin; ovulary much sunk; fruit quite small, almost globular, one-seeded, terminated by a comparatively broad limb of thin structure, and separated from it by some constriction; pericarp very thin.

Mossman's-River; Sayer. Russell's-River; Johnson.

Among Australian congeners nearest to *E. angophoroides*, which is now also known from Fitzroy-River and Trinity-Bay, but specifically separable by larger, almost sessile leaves, not gradually narrowed in to the base, with much thinner venulation; further, by the nearly membranously angular branches of the inflorescence, almost complete absence of pedicels, less denticulated calyces broader at the base, and by the fruit, even in a ripe state, being edged by a higher rim. *Eugenia Ventenatii* is still further removed already by much larger fruits, although the leaf venulation in that species is also very thin. Our new plant has the very angular peduncles in common with *E. lanceifolia*, which species moreover has very similar leaves, but its flowers are of larger size, the calyx is semi-ovate and conspicuously lobed, and the fruit is very much longer. Notable remains also some similarity to *E. cordifolia* and *E. Neesiana*, but neither of these has the

remarkably angular branches and peduncles of our plant, and their fruits are much larger.

#### EUGENIA JOHNSONI.

Glabrous ; branchlets almost cylindric ; leaves of firm consistency, mostly ovate-lanceolar, much contracted towards the blunt summit, gradually narrowed into a conspicuous petiole, rather prominently pinnular-venulated, but with concealed punctation ; peduncles slender, axillary and terminal, from three- to several-flowered ; bracteoles narrow, fugacious ; tube of the calyx smooth, passing gradually into the pedicel ; lobes four, rather large, almost semi-ovate, during anthesis as long as the tube or longer, devoid of any conspicuous membranous margin ; anthers narrow-elliptic ; fruit comparatively large, one-seeded, turgid-ovate, but excavated and slightly incurved four-lobed at the summit, its pericarp succulent, outside red.

Mount Bartle Frere, at about 4,000 feet elevation ; there associated with *Halfordia*, which, when in fruit, bears great resemblance to this *Eugenia* ; S. Johnson.

A tree, known to attain a height of 40 feet. Leaves seldom more than 3 inches long and  $1\frac{1}{2}$  broad, but often smaller. Inflorescence  $2\frac{1}{2}$  inches or less long. Calyx before expansion clavate-ovate, lobes nearly  $\frac{1}{4}$  inch long, showing no pale membranous dilatation and only slightly overlapping in bud. Petals only to a small extent overreaching the calyx. Fruit  $\frac{1}{2}$  to  $\frac{3}{4}$  inches long ; its pericarp rather thick, of subacrid and somewhat aromatic taste. Seed turgidly ovate, about  $\frac{1}{3}$ -inch long ; its cotyledons one above the other. The unexpanded flowers resemble those of some *Eucalypts*, and impart to this species a peculiar appearance.

Near *E. Tierneyana* ; but that species recedes in thinner and often more elongated leaves, with more distant and therefore fewer primary venules, in ampler florescence, in almost semi-orbicular calyx-lobes conspicuously membranous towards the margin, in shorter and thus more globular fruits. As *Eugenia Sayeri* a plant has now been distinguished from the same region. This additional species has leaves much like those of *E. Johnsoni*, but flowers similar to those of *E. Tierneyana*. The fruits of this congener remain unknown.

Specimens of several other new Australian Eugenias accumulated through many years in our collections ; but the material is still insufficient for offering satisfactory diagnoses of them.

*Eugenia Armstrongi* has been found recently by Mr. Nicholas Holtze near Port Darwin. From it differs *E. angophoroides* in angular branchlets, broader leaves above darker coloured and with a rather less prominent venulation, somewhat smaller flowers devoid of conspicuous pedicels, less lobed calyces, evidently larger fruits outside blackish.

*E. myrsinocarpa* is a species collected by Fitzalan at Trinity-Bay, with shorter, less closely venulated, and more acuminate leaves, very thin ultimate peduncles, less broad, indeed quite globular, fruits. Leaves much like those of *E. apodophylla*.

*E. carissoides* is now also known from Cape York and Endeavour-River

*E. hemilampra* occurs on Mossman's-River (Sayer), Endeavour-River (Persieh), Mt. Bartle Frere (Johnson).

*E. cormiflora* grows on Endeavour-, Daintree-, and Johnstone-Rivers. The fruit is there much eaten by the autochthones.

*E. Tierneyana* extends to Trinity-Bay (Sayer) and Daintree-River (Fitzalan).

#### EMBELIA FLUECKIGERI.

Leaves on corrugated short petioles, of firm texture, almost elliptic, at the base blunt, devoid of denticulation, closely reticular-venulated, glabrescent; panicles densely tomentellous; pedicels very short or some almost absent; segments of the calyx five, rather long, narrow-elliptic; petals of about double calyx-length, tender-membranous; stamens five, about as long as the petals, their filaments scantly beset with hairlets, the anthers broadly cordate; ovulary and lower portion of the style short-lanuginous.

Russell-River; Stephen Johnson.

Shrub of somewhat laurinaceous aspect, though of rambling habit. Leaves to 4 inches long, to  $1\frac{1}{2}$  inch broad, shining on both sides, hardly paler beneath, their pellucid pores not readily visible. Branches of the panicle numerous, but mostly short. Vestiture of the inflorescence brownish. Flowers in racemous clusters. Bracts of rather conspicuous size. Petals about  $\frac{1}{4}$  inch long, very perceptibly dotted, much less pubescent than the calyx. Filaments linear-setaceous. Fruit yet to be obtained. Allied to *E. Nagushia*, but the leaves are neither distinctly acuminate, nor narrowed into the petiole; further, the flowers are larger and neither tetramerous nor glabrous. From *E. Cattam* it differs already in larger, less pointed leaves, ampler inflorescence and longer calyx. The species is very different from our only other indigenous congener, namely *E. Australiana*. Two older names exist for the genus *Embelia*, but neither became supported or confirmed by any quoted or implied species-names. Several of the Australian Myrsines are referable to *Labisia*, on account of the valvular preflorescence of their corolla.

This plant, of a medicinal genus, is dedicated to Dr. Friederich Flückiger, the meritorious Professor of Pharmacology in the University of Strassburg, at about the time of his septuagenarian's jubilee as a public scientific festival.

March, 1892.

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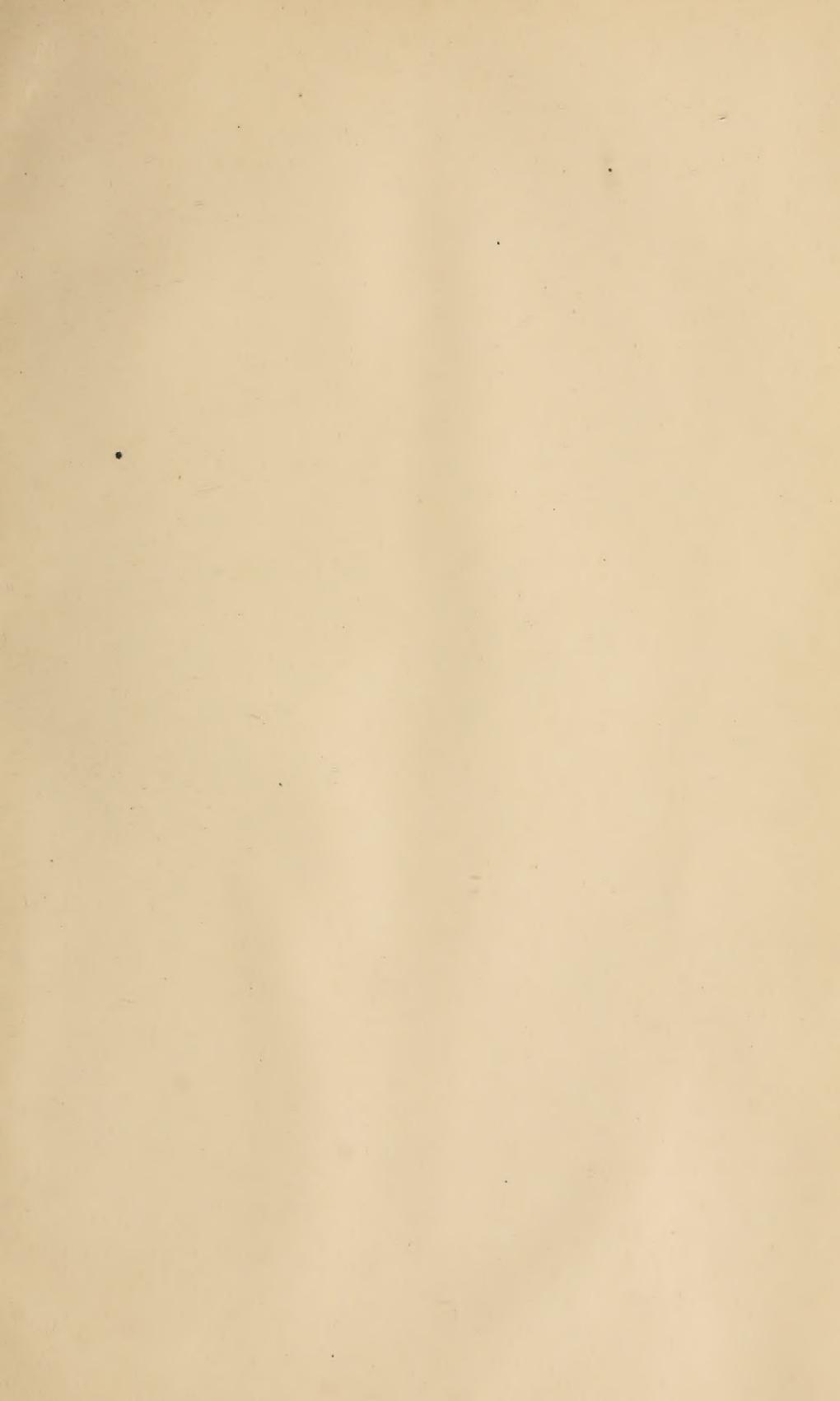
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